

AVARS, BULGARS AND MAGYARS ON THE MIDDLE AND LOWER DANUBE

Editors

Lyudmila Doncheva-Petkova – Csilla Balogh – Attila Türk

Proceedings of the Bulgarian-Hungarian Meeting,
Sofia, May 27–28, 2009



National Institute of Archaeology
and Museum BAS
Sofia



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СОФИЯ – PILISCSABA
2014

The publication of this volume was funded by the generous grants from the National Cultural Fund (Nemzeti Kulturális Alap, NKA 3437/01022) and the Hungarian Scientific Research Fund (Országos Tudományos Kutatási Alapprogramok, OTKA PUB-K 111155, OTKA K 7106369, OTKA NK 72636)



Front Cover

Detail from Bowl No. 21 of the Nagyszentmiklós Treasure by Imre Huszár

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ISBN 978-963-9911-55-0

HU-ISSN 1215-9239

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ARCHAEOLINGUA

2014

ARCHAEOLINGUA ALAPÍTVÁNY
H-1014 Budapest, Úri u. 49.

Desktop editing and layout by Gergely Hős

Printed by Prime Rate Kft.

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THE ANALYSIS OF POTTERY FROM 10TH–11TH-CENTURY GRAVES IN THE CARPATHIAN BASIN. TECHNOLOGICAL AND TYPO-CHRONOLOGICAL STUDIES

Szabina MÉRVA

The topic of my paper is the investigation of ceramic vessels from 10th–11th-century graves. The relative homogeneity of the ceramic material of the period (when compared to other periods) makes the collection of vessels especially important, since at the present state of research it is 10th-century metal objects that provide a secure date for pottery, and not the other way round, or only very rarely. The increasing number of excavations at settlements and cemeteries has yielded lot of new information for research on Conquest Period and Árpád Period pottery, which provides a good opportunity to rethink and continue the topic of J. Kvassay's dissertation.¹ The increasing precision of the internal chronology of the period, new scientific methods and the increased number of finds all shed new light on 10th–11th-century ceramics, and our investigations provide new information regarding both technology and chronology.

The study area is the northern part of the Carpathian Basin until the line of the Danube, including the Upper Tisza region, the northern part of the area east of the Tisza to Bihar in the east and the Sebes-Körös River in the south, the northern third of the Danube–Tisza interfluvium to the southern border of Pest and Jász-Nagykun-Szolnok Counties, and Northern Hungary.

In the first phase of collecting data from the Carpathian Basin I chose this area because of the following reasons:

- a) A number of well-defined regions with larger concentrations of cemeteries (the Zemplén, Borsod, Szabolcs, Heves, Middle Tisza, Hajdú-Bihar, the Danube Bend and the Nógrád blocks) are located within this area.
- b) The analyses of most of the cemeteries of these regions have already been published, thus an appropriate amount of information is available for the study of ceramics from graves.
- c) A large enough sample (95 vessels from 84 sites) is available for study.
- d) The excavation of 10th–11th-century settlements carried out and partly published in the area – Borsod-Edelény (WOLF 1992; WOLF 2003; WOLF 2006), Felsőzsolca-Várdomb, Karos-Tobolyka, Mezőkeresztes-Cethalom, Mezőkeresztes-Lucernás (SIMONYI 2010), Szikszó-Vadászpatak (WOLF 1993) – all provide lot of additional information on the pottery of the period.
- e) The study of vessels from 10th–11th-century graves may serve as the basis for the collection of the material from the rest of the Carpathian Basin.

HISTORY OF RESEARCH

Strictly speaking, previously only one researcher investigated the ceramics from the graves of the period. Despite this fact, I find it important to

briefly review prior research, since fundamental works had been published on the topic before J. Kvassay's dissertation and during the past three

¹ I would like to express my gratitude to M. Wolf for allowing access to the materials from Borsod-Edelény and Szikszó and her generous help, to dr. L. Révész for supporting my research and his selfless help, to dr. T. Vida, my supervisor for his invaluable guidance and to dr. M. Takács and dr. J. Kvassay for the personal consultations. I should like to thank J. Puskás, museum keeper and potter for his help and advice (Hungarian National Museum, Budapest), dr. E. Istvánovits, A. Jakab (András Jóna Museum, Nyíregyháza), dr. T. Pusztai, Gy. Kalászdy (Ottó Herman Museum, Miskolc), K. A. Szilágyi, T. Faragóné Csutak (Déri Museum, Debrecen), D. Gašaj, E. Mirošayová (East Slovakian Museum, Košice), dr. L. Fodor, S. Tanyi (István Dobó Castle Museum, Eger), T. Majcher (Ferenc Kubinyi Museum, Szécsény), dr. K. Kővári (Ignác Trágor Museum, Vác), J. Lakatos (Börzsöny Museum, Szob), dr. L. Madaras (János Damjanich Museum, Szolnok), P. Langó (Hungarian Academy of Sciences, Research Centre for the Humanities, Institute of Archaeology, Budapest), dr. J. Laszlovsky (Central European University, Department of Medieval Studies) and Zs. Petkes (Hungarian Academy of Sciences, Research Centre for the Humanities, Institute of History, Hungarian Prehistory Research Team) for allowing access to their materials.

decades as well. These had laid the ground for later research in this area and raised a number of important questions and the need to collect the mostly intact vessels associated with datable finds in closed assemblages throughout the Carpathian Basin.

About 60 years after the first publication of a Conquest Period grave, J. Hampel in his early works (HAMPEL 1896, 78, 80, 105; HAMPEL 1907, 106, Pl. 5) only mentioned in passing that the graves contained pottery as well; due to the focus on metal artefacts, their study was neglected. Research on pottery, both from the Árpád Period and the 10th century, can be connected to J. Höllrigl's work from 1930 and 1933 (HÖLLRIGL 1930; HÖLLRIGL 1933). Observations on the technology of medieval pottery were first made by I. Holl (HOLL 1956) and N. Parádi (PARÁDI 1959). N. Parádi collected and published vessels dated by coins in the 1963 issue of *Archaeológiai Értesítő*, pointing out two 11th-century vessels as well (PARÁDI 1963). B. Szőke's 1955 article on clay cauldrons is of fundamental importance (SZŐKE 1955), and we have to mention the publications by K. Mesterházy (MESTERHÁZY 1975) and I. Fodor as well (FODOR 1985), which investigated the eastern connections of vessels with ribbed neck. In 1969 A. Kiss published an article on 10th–11th-century graves with vessels (KISS 1969). J. Kovalovszki's excavations at Doboz-Hajdúirtás had for a long time provided the basis for the dating of early settlements (KOVALOVSZKI 1975).

J. Kvassay's above-mentioned dissertation (KVASSAY 1982; KVASSAY 1984) was the first complete collection of vessels from 10th–11th-century graves. The comprehensive database of the work still provides the basis for any research on the pottery of the period, especially since before that only a few selected vessel types had been investigated more thoroughly. M. Takács' fundamental work on the clay cauldrons of the Carpathian Basin was published at about the same time (TAKÁCS 1986), and his later work in the Little Hungarian Plain also focused on the improvement of

the chronology of the period (TAKÁCS 1993; TAKÁCS 1996). Thanks to the increasing number of rescue excavations, settlement material from the period is continuously accumulating, and the publications provide a large amount of new data (LÁZÁR 1998; VÉKONY 2002; TAKÁCS 1996b; TAKÁCS 2006; SIMONYI 2001; SIMONYI 2001a; SIMONYI 2005). U. Fiedler published a review of the problems of 8th–10th-century settlements in the Carpathian Basin (FIEDLER 1994). M. Wolf made new observations in connection with the ceramic material from the 10th-century settlement from Borsod-Edelény, dated before the construction of the 11th-century earthwork (WOLF 1992; WOLF 2003; WOLF 2006). Thanks to the vigorous settlement research in northeast Hungary, E. Simon was able to provide a review of the ceramic technologies of the period, with the inclusion of the results of natural scientific analyses (SIMONYI 2005; SIMONYI 2010), while H. Herold was able to observe certain tendencies in the material of early medieval settlements based on her regional studies (HEROLD 2006). After J. Kvassay's work, J. Szigeti has contributed to the study of 10th–11th-century pottery from funerary contexts in connection with the reanalysis of the cemetery of Halimba-Cseres (SZIGETI 2013). During the past 30 years, the number of 10th–11th-century cemeteries with ceramic grave-goods has increased considerably. The analysis of the 9th–12th-century cemetery of Čakajovce (Hung. Csekej) was published in 1995 (REJHOLCOVÁ 1995), while H. Ciugudean published a short analysis of the ceramic material from the 9th–11th-century cemetery of Alba Iulia-“*Stația de Salvare*”. (Hung. Gyulafehérvár-Mentőállomás) in 2007 (CIUGUDEAN 2007), which provided numerous new questions for future research. The material from the repeatedly investigated site of Oroszvár-Wiesenacker-dűlő has recently been analyzed, during which the author investigated the graves with ceramic grave-goods and the pottery of the site (HORVÁTH et al. 2012).

ASPECTS OF THE ANALYSIS OF THE POTTERY OF THE PERIOD TECHNOLOGY

The first analysis of medieval ceramic technology in the Carpathian Basin was carried out by I. Holl, using ethnographic examples as well (HOLL 1956), while N. Parádi reconstructed the technology of hand-wheeled pottery manufacture through a thorough analysis of Migration Period and Árpád Period vessels (PARÁDI 1959). M. Takács discussed in detail the manufacturing technologies of Árpád Period clay cauldrons (TAKÁCS 1983). E. Simonyi (SIMONYI 2005) and M. Wolf (SZILÁGYI et al. 2004) enriched our views on ceramic technologies through natural scientific investigations on Early Árpád

Period ceramics from northeast Hungary. Recently Zs. Mersdorf reconstructed and demonstrated the manufacturing technologies of 9th-century hand-wheeled pottery from Zalavár (MERSDORF 2007). From the beginning, researchers generally accepted the view that the period was characterized almost exclusively by vessels made on the slow wheel (HÖLLRIGL 1930, 143; HÖLLRIGL 1933, 85; HOLL 1956, 177; PARÁDI 1959, 22; KVASSAY 1982, 18, 44; KVASSAY 1984, 174; TAKÁCS 1997, 208; TAKÁCS 1998, 56; WOLF 2003, 90, 95; WOLF 2006, 48; HEROLD 2004, 55; HEROLD 2006, 70–73; SIMONYI 2005, 46; SZŐKE

1980, 185; KOVALOVSKI 1975, 211; MESTERHÁZY–HORVÁTH 1983, 121; FODOR 1984, 106).

In the Conquest Period and Árpád Period, hand-made pottery, characteristic for the preceding centuries, is not attested (WOLF 2003, 100–103; WOLF 2006, 54) or only in very small amounts (KVASSAY 1982, 18; MESTERHÁZY–HORVÁTH 1983, 122; TAKÁCS 1996, 170; TAKÁCS 1986, 109–111; LÁZÁR 1998, 15, 30, 32, 37, 41, 67, 74; see VÉKONY 2002, 27 for a review of the problem). The phenomenon is hardly surprising and can be explained with the survival of

manufacturing traditions (MESTERHÁZY–HORVÁTH 1983, 122; TAKÁCS 1996, 170). Beside the probably imported amphora from Sósartyán and the jug from Algyő (KVASSAY 1982, 18), the literature sporadically mentions vessels and ceramic fragments turned on a fast wheel.³ Based on, among others, the material discussed below we have to get rid of the commonplace that 10th–11th-century pottery manufacture was almost completely uniform. Technological variability can be demonstrated in the later phase of the Árpád Period as well (TAKÁCS 2009, 238).

CHRONOLOGY

The problematic issues of the ceramic chronology of the period can be divided into three major groups. A number of issues are connected to the question to what extent can we distinguish Early Árpád Period pottery (10th–11th-century) from the settlement pottery of the preceding period (primarily the 9th-century) or to what extent can we distinguished 10th-century and 11th-century pottery? We have to discuss the real dating value of chronological more sensitive elements, especially in settlement material, where primarily types of decorations are available for analysis (with the largest amount of analyzable data). Finally we have to touch upon an important and debated topic: the chronological position of clay cauldrons, a characteristic, although quantitatively only minor, vessel type in the material.

According to the present state of research, the survival of Late Avars can be demonstrated archaeologically at least in the 9th-century (SZÖKE 1990, 153). Based on the observations made so far, this survival can be felt in ceramic manufacturing traditions as well. During his research, B. M. Szőke outlined the Late Avar ceramic material from the Körös region. Accordingly, the period is characterized by hand-wheeled pottery (20–30%), handmade pottery (70–80%), handmade cauldrons, handmade vessels with stamped lattice pattern (0.5%) and baking bells (1–2%) (these five types comprise Szőke's Group A). Based on his studies, these can be easily distinguished from Group B, which he dates to the Conquest and Árpád Periods and contains only hand-wheeled types (SZÖKE 1980, 182–188). Later

on he modified his views and dated Group A to the 9th-century (SZÖKE 1988).

When examining the 10th–14th-century pottery of the Little Hungary Plain, M. Takács considered baking bells (Mosonszentmiklós-Egyéni földek, Lébény-Billedomb) (TAKÁCS 1996, 170) and handmade cauldrons (TAKÁCS 1986, 109–111), clay flasks and bowls with inverted rim (TAKÁCS 1997, 208) surviving elements of an earlier tradition and dated the appearance of hand-wheeled clay cauldrons to the 10th century (TAKÁCS 1986; TAKÁCS 1996). M. Wolf interpreted as archaic elements 10th century elongated jars, vessels with decoration on the inside of the rim and the survival of a characteristic 9th-century decorative motif, the incised wavy line bundle (WOLF 2003, 96, 2–3. kép, 7. kép). When examining Late Avar Period pottery from graves, T. Vida made the same observation and considered 10th century elongated jars decorated with line bundles and wavy line bundles as evidence for the survival of a Late Avar Period tradition.⁴

According to J. Kvassay's research, the survival of 8th–9th-century characteristics in the pottery from graves can be observed in the northern part of the Carpathian Basin, e.g. on the vessels of Bešeňov (Hung. Zsitvabesenyő), Grave 13 and Nitra (Hung. Nyitra), Grave 96 (KVASSAY 1982, 10, 39). We have to mention the vessels from the cemeteries of Hurbanovo (Hung. Ógyalla), Michal nad Žitvaou (Hung. Szentmihályúr) and Tvrdšovce (Hung. Tardoskedd), which could be dated rather to the 9th-century. The situation is the same with Grave 61 at Zrnovec nad Váhom (Hung. Tornóc), where the

³ A rim fragment of a vessel with cylindrical, ribbed neck made on fast wheel was reported already in 1991 by D. Jankovich B. from Keszthely-Fenekpuszta (Trench 6, Hearth 3, lower layer, associated with the rim of a clay cauldron) (JANKOVICH 1991, 186, 192, 205, 9. kép 11), and a jug from Grave 2/VIII, Phase 2 from Alba Iulia–"Stația de Salvare" (Hung. Gyulafehérvár) belongs here as well (CIUGUDEAN 2007, 248, 251, Pl. 5. 2).

⁴ I would like to thank T. Vida for allowing me to consult the manuscript of his MA Thesis. Vida T.: *A késő avar sírkerámia a Dunától keletre*. Budapest 1986.

form of the vessel is reminiscent of 9th-century shapes, but was associated with an S-terminalled ring (KVASSAY 1982, 40). A handmade vessel from the 10th-century Grave 35 of the Avar cemetery of Visznek-Kecskehegy fits nicely into the series of Avar Period grave pottery, but based on the associated finds it was dated to the 10th-century (KVASSAY 1982, 8, 232–233, XL. tábla, 2. kép). As opposed to J. Kvassay's opinion, who suggested that the vessels became lower through time, researchers now think that beside these lower pots, elongated versions appear as well, e.g. in the case of Borsod-Edelény (archaic elongated jars) (WOLF 2003, 96).

A typological examination draws attention to the pottery of certain graves in the cemetery of Halimba-Cseres. For example, the vessel of Grave 206 in itself "*does not fit the picture*", if we regard 10th–11th-century ceramics; we still cannot ignore the fact that the grave contained a thick, silver, ribbed S-terminalled ring, based on which the excavator placed the grave into the so-called third phase (second half of the 11th-century, beginning of the 12th-century) (TÖRÖK 1962, 161, Taf. XCII). Similarly, the vessel of Grave 50 was associated with a bronze S-terminalled ring, based on which Gy. Török dated this grave to the second phase. The case is similar with the vessel of Grave 47 (TÖRÖK 1962, 146, Taf. XLVI). Gy. Török based, among others, on these vessels the view that Avar Period pottery traditions survived in the undoubtedly later phase of the site (TÖRÖK 1962, 54–63, 95–98). Beyond the fact, however, that their technology (low quality, handmade) and form differs from the rest, it is striking that incised line-bundles, a decorative motif interpreted as another important sign of survival, is missing from Halimba. U. Fiedler has noted that a group of vessels from 10th–11th-century graves are theoretically (typologically) characteristic for the 8th–9th-century material (e.g. Besenyő, Grave 83, Sered/Szered (SI) Grave 8/55 (KVASSAY 1982, 29, 40), Prša/Perse (SI) Graves 43 and 76, Bánov/Bánkeszi (SI), Grave 25, Szeged-Algyő Grave 97) (FIEDLER 1994, 339–341).

U. Fiedler's study brought interesting, although controversial, results regarding 8th–9th–10th-century pottery, and raised important questions especially regarding the results presented so far. His main question is, whether the Conquering Hungarians produced already wheel-made clay cauldrons. According to U. Fiedler's research, this hypothesis (the presence of wheel-made clay cauldrons among the Conquering Hungarians) cannot be in fact proved through any datable find assemblages

(FIEDLER 1994, 332). Fiedler was looking for evidence to connect B. M. Szőke Szőke's Group A and Conquest Period grave ceramics. He established that undecorated handmade vessels are practically missing from graves. Comb decorated vessels, generally characteristic for ceramic production, are present in B. M. Szőke Szőke's Group A, although only in small numbers. The cog-wheel pattern appears first in the 11th century, while B. M. Szőke's Group A is most certainly earlier than that! Baking bells and cauldrons are understandably missing from the graves.⁵ Vessels with ribbed, cylindrical neck and bowls are attested in 10th-century settlement materials; they are, however, still missing from B. M. Szőke's Group A. Consequently, a comparison of Conquest Period pottery from burial contexts with B. M. Szőke's Group A, similar e.g. to Cs. Bálint's attempt to compare the settlement pottery from Eperjes with Late Avar Period pottery from graves from Kaján, is not yet possible as established by U. Fiedler (FIEDLER 1994, 342–344). Doubtlessly, the number of pottery from burial contexts is still so small that it remains a question whether it can be considered representative and suitable to analyze the ceramic manufacturing traditions of a certain region. One of the aims of this paper is to attempt to answer this question.

The first reaction on the part of Hungarian researchers was written by M. Takács, where he noted that knowledge of the material from north-east Bulgaria and southwest Romania can be assumed from U. Fiedler's arguments, but also noted that the study is outdated. Had the Austrian researcher's arguments been correct, we would have been forced to place the whole find horizon including belt sets to the 10th-century – which is a highly unlikely, unfounded, even absurd, suggestion (TAKÁCS 2009, 235).

M. Wolf considered the circle characterized by handmade vessels and baking bells (Avar Period and 9th-century material) and Árpád Period pottery (characterized by wheel-made clay cauldrons) easily separable from the material of early, 10th-century settlements (WOLF 2003, 99–100). M. Takács considers the publications of the ceramic finds from Borsod-Edelény the most recent example of a certain trend in the research on Árpád Period pottery (WOLF 2003, 85–107; WOLF 2006, 47–58). The author, M. Wolf tried to distinguish clearly 10th and 11th-century pottery in the whole Carpathian Basin. According to M. Takács, with this she revives the theory of the Méri school, since she considers

⁵ According to U. Fiedler it is logical (although not more than that, since it cannot be proven) that cooking vessels were not placed in the graves. As a consequence, only those cooking pots were used that were suitable to contain single dishes (FIEDLER 1994, 342).

proven the existence of a clear difference between 10th and 11th century pottery (TAKÁCS 2009, 237).

Furthermore, an important example should be born in mind when discussing the possibility of distinguishing 9th–11th-century ceramic material: in my opinion the *general* use of handmade vessels in the 10th–11th-centuries has been neither proven nor dismissed convincingly yet. In an article from 1984, I. Fodor drew attention to an unpublished material: in 1965, during N. Parádi's excavation at Békés-Ditér, a reconstructable baking bell was found and "*in the immediate vicinity of the baking bell, in the fill above the layer with charred wood*" a silver coin of Stephen III (1162–1172) was discovered (CNH I. 119).⁶ Based on this it seems certain that the use of handmade baking bells cannot be excluded with certainty even in the 12th century. However, fragments of baking bells were found in the Early Árpád Period Feature 449 (a house) at Ménfőcsanak-Szeles dűlő associated with a pottery fragment decorated with cog-wheel pattern, and in Feature 418 (an oven) associated with a pottery fragment decorated with scroll.

M. Takács emphasized (TAKÁCS 2009, 236) that according to the results of numerous settlement excavations, there is no clear break between the ceramic material of the 10th and 11th-centuries,⁷ thus we cannot date them to a shorter period than two centuries. He argues that publications of pottery from burials have shown that characteristic vessel and/or rim forms dated to the 10th-century appear in 11th-century contexts as well. He mentions as exception the vessel type with cylindrical ribbed neck that has not yet been found in a securely dated 11th-century grave. My database, however, does not fully support this statement, since only 4% of the available vessels can be dated to the 11th-century, and altogether 13% to the end of the 10th-or the beginning of the 11th-century. So far 11 vessels with cylindrical neck have been found in the region, and one without handle from Miskolc-Repülőtér was dated based on the date of the cemetery to the turn of the millennium. I find these data insufficient to decide whether this object type should be dated only to the first half of the period under study.

In connection with chronological problems we have to discuss the chronological sensitivity of the best observable decoration types (on ceramics from both settlements and graves). N. Parádi's article, which was published almost fifty years ago, is still one of the best reviews of the issue (PARÁDI

1963). Four of the assemblages discussed by him are relevant for our period of study. The vessel of Jászberény-Borsóhalom is decorated with incised scrolls and dated by 596 coins of Duke Béla (1046–1060; CNH.I.15) and 72 coins of Béla I (1060–1063; CNH.I.16). Two vessels found near Zemun are decorated with a single wavy line with incised scrolls beneath it on the shoulder of one, and with incised wavy lines on the shoulder of the other. They are dated with the gold coins of Michael VII Doukas (1071–1078) and Nikephoros III (1078–1081) and the silver coins of László I (1077–1095) (CNH.I.26, 27, 28). From Andornaktálya a vessel with cog-wheel pattern together with ca. 150 Kálmán denars (1095–1116; CNH.I.38, 41, 43) had been delivered to the museum (PARÁDI 1963, 207, 1. kép 1–3, 222, 14. kép 1–2a). The series of coin finds are complemented by the find of Tadtén, Austria (Hung. Mosontétény), with coins dated around 1130 and a jar decorated with wavy lines (STEININGER 1985, Kat. Nr. 1).

Although in smaller numbers, but we do have at our disposal ceramic finds from settlement contexts and burials documented on excavations and dated by coins to the Early Árpád Period. From Pit 19 at Esztergom-Szentgyörgymező, rim and wall fragments of vessels decorated with incised line bundles, wavy lines, nail impressions and cog-wheel pattern (LÁZÁR 1998, 71, 55. kép) were found in association with a Salamon coin (1063–1074) (LÁZÁR 1998, 71, 73). The feature had been dug into a house, whose fill contained the neck fragment of a vessel with ribbed neck, decorated with impressed dots, and sherds of jars decorated with incised wavy line bundles, nail impressions, wavy lines and scrolls (LÁZÁR 1998, 24–26, 51–53. kép). In the fill of Feature 559 (a house) at Ménfőcsanak-Bevásárlóközpont, a Duke Béla coin (1048–1060) (TOMKA 2000, 10) provides a date for the sherds decorated with wavy line, scroll, garland and a band of scrolls.

From the Conquest Period, vessels from graves dated by coins are attested only in six cases. The vessel from Grave 8 at Balatonújlak-Erdő dűlő, M7/3-37 (LANGÓ-SIKLÓSI 2013, 147–148) is decorated by a combination of a double wavy line, a double line, a triple wavy line and two triple line bundles. It has to be noted that all the elements run around the circumference of the vessel. The grave is dated by a Milanese coin of Hugo of Provence. Apparently, a vessel decorated by line bundles in

⁶ After FODOR 1984, 106, note 64, based on the registry of the Hungarian National Museum (MNM), Békés-Ditér, excavation documentation (MNM Archives Ha 2000.VI./36, 82.1.1.B. MNM, 82.1.4.B. MNM).

⁷ This kind of investigation was first carried out by J. Gy. Szabó (SZABÓ 1975, 23–24).

three rows running around its circumference at Budapest-Szentlőrinc, Gloriette, was associated with a coin of Lothar II (LÁSZLÓ 1942, 799; FEHÉR et al. 1962, 124). In Grave II/1 of Kapos-Eperjesszőg (RÉVÉSZ 1996, 15–16), the undecorated, handmade vessel is dated by a non-perforated, flattened silver dirham. The undecorated jar from Grave II/37 of Kenézlő-Fazekaszug (FETTICH 1931, 89) was associated with a silver coin (Pavia, Rodolphe de Bourgogne, 922–926), perforated in two places. Grave 60 from the cemetery of Szob-Kiserdő (BAKAY 1978, 29–33), dated by 11 west European silver coins (four Charles the Bald coins, four Berengar I [888–915] coins, two coins of Hugo of Provence [926–931] and an undefined west European coin), yielded a jar decorated with an incised wavy line with a fast amplitude on the shoulder and incised scrolls below, down to the lower two fifth of the vessel. Finally, we have to mention Grave 4 from Tiszanána-Csehtanya, where a cooking pot with wavy line and line bundle decoration was found together with 11 West European coins (Charles the Bald's four perforated coins [840–875], Berengar I's [888–915] four perforated Milanese coins, Hugo of Provence's [926–931] two perforated coins, and one undetermined Milanese (?) coin) (RÉVÉSZ 2008, 287).

Obviously, the above 13 assemblages dated by coins do not provide a proper basis for drawing wide-reaching conclusions, but ignoring them would be a mistake as well. The decorations of vessels from well-dated contexts provide the following picture: the time-span of the use of the types cannot be narrowed down based on the available data. We have to draw special attention on the motif of the wavy line bundle, which is interpreted as a surviving element, and appears just as much on vessels from the end of the 11th-century (e.g. the vessel found between Sremski Karlovci and Zemun), as on the 10th-century vessel of Tiszanána. Of the 14 finds only one is a jar decorated with cog-wheel pattern, from the 12th-century assemblage of Andornaktálya.

Settlement finds reflect a similar situation. If we examine the combination of motifs observable on one vessel, for example at the Early Árpád Period settlement of Ménfőcsanak-Szeles dűlő,⁸ the following can be established: wavy line bundles appear together with line bundles, nail impressions and scrolls; line bundles appear together with wavy line bundles, scrolls, wavy lines and nail impressions. Densely incised scroll was attested once with cog-wheel pattern (!) as well, thus it is certainly coeval with most other decorative motifs. The most widely attested scroll appears together with wavy lines, nail

impressions, lines bundles and garlands on the same vessel, while wavy lines appear together with scrolls, wavy line bundles, line bundles and nail impressions. In the case of the later cog-wheel pattern and garland motifs (perhaps dated to the second part of the period) we could observe that garlands were combined only with scrolls, while cog-wheel pattern is usually on its own, and was attested once associated with a densely incised scroll (and once with line bundle from the rampart of Sopron – which is very rare), and once associated with nail impressions. If we accept the assumption that the increased number of combinations may be connected to dating, then we can establish that beside the cog-wheel pattern and the garland, all the other motifs are characteristic throughout these two centuries; more exactly, the date of their first appearance cannot yet be established with more precision. Future research might be able to shed light upon the change of the proportion of decorated vessels during these two centuries. Due to the fragmentation of settlement ceramics, we do not yet have reliable data at our disposal, and we cannot yet draw conclusions regarding the temporal changes of vessel forms and rim types.

Finally, we have to mention the difficulties of dating Early Árpád Period clay cauldrons. It has been put forward as an axiom rather early in the history of research that hand-wheeled clay cauldrons are a vessel type brought into the Carpathian Basin by the conquering Hungarians; thus, it is ethnically specific and was a by-product of their semi-nomadic lifestyle. In the already mentioned 1933 article on Árpád Period ceramics, J. Höllrigl studied clay cauldrons as well, and established that it is a characteristic vessel form of the semi-nomadic Hungarians (HÖLLRIGL 1933, 93). He dated it to the 12th–13th-centuries, just like K. Szabó, who also defined it as a characteristic vessel type of semi-nomadic camps (SZABÓ 1938, 25). Based on his surveys in the Rábaköz area, B. Szőke regarded it a 10th-century, ethnically specific vessel type. According to his research, this was supported by the fact that the type is very rare in Somogy County, which was an area occupied by Slavs in the 10th-century; such vessels are missing from Moravian, Czech or Austrian areas as well (SZŐKE 1955, 90). In contrast to these earlier opinions, however, based on M. Wolf's results it can now be stated that there is a group of early settlements whose material is characterized by jars of various sizes, flower pot shaped bowls and vessels with ribbed neck, but not by clay cauldrons (WOLF 2003, 100–103) (e.g. Borsod-Edelény (WOLF 1992; WOLF 2003; WOLF 2006), Örménykút (HEROLD 2004),

⁸ I would like to thank here again M. Takács for allowing me to analyze the material of the Early Árpád Period settlement at Ménfőcsanak.

Esztergom-Szentgyörgymező⁹). When discussing the chronology of Örménykút, H. Herold dated Phase 3 (between the Avar and Árpád Periods) to the 10th century based on analogies and after excluding other possibilities (HEROLD 2004, 63).

After the collection of data by J. Kvassay it became clear that clay cauldrons have not been attested in the graves of the conquering Hungarians,¹⁰ and during my work I have not yet found this vessel type either as a vessel from a grave containing food or among the sherds found in the fill of the graves. Among the known vessel forms, beside pithoi, churning vessels and larger jars (except for the vessel of Grave 251 at Ibrány-Esbóhalom) clay cauldrons are also conspicuously missing from graves. A possible explanation might be that large cooking and storage vessels were simply not placed in graves (TAKÁCS 1997, 206), although this custom has been attested among other peoples (FODOR 1984, 106; TAKÁCS 1986, 23, Notes 277–278, 25, Notes 297 and 308, 26, Notes 318–319, 131, Note 996). Based on her settlement research, M. Wolf is of the opinion that there is a chronological difference between the vessels of the 10th century and the clay cauldrons. She dates the latter to the 12th–13th centuries, noting that clay cauldrons are characteristic not only for the material of villages, but also appear in royal courts, cities and monasteries as well, localities hardly describable as semi-nomadic. She tries to solve the contradiction of low number of clay cauldrons in the Upper Tisza region and their lack in the Bodroghöz and Rétköz area by suggesting a chronological difference between the materials of these regions (WOLF 2003, 100–103). Takács interpreted the areas with a low number of clay cauldron finds as regions outside the habitation area of the semi-nomadic, pastoralist population (TAKÁCS 1986, 136–137; TAKÁCS 1996a, 336). In his latest article, M. Takács cites three finds of clay cauldrons associated with vessels with ribbed neck as counter examples (TAKÁCS 2009, 237). In 1966 A. Habovštiak published the material of the semi-subterranean House 5/63 at Bíňa-LPG Station (Hung. Bény) (HABOVŠTIÁK 1966, Abb. 29, 1–4, 15). Stratigraphic observations indicated that this house lay below the fortified hilltop settlement, which had most probably been founded at the time of the formation of the Hungarian state, at the turn of the 10th and 11th-centuries (HABOVŠTIÁK 1966, 467–479).

Due to its stratigraphic position, the above scholar considers this clay cauldron rim important evidence in the chronological discussion. The second counter argument is provided by Feature 16 at Sľažany-Poloha Domovina (Hung. Szelezsény). Here a clay cauldron fragment was associated in the same stratigraphic unit with a bipartite lyre-shaped buckle¹¹ (RUTTKAY 1992, Abb. 9.5, 11.6). The third piece of evidence are two finds of hand wheeled clay cauldrons dated to the “end of the Avar Period”: one from Kompolt-Kistér and another from Mártély-Szegfűdomb (B. NAGY 1984, 241). The significance of the round-based cauldron from Kompolt is that in Feature 406, 38 pieces of a single reconstructable vessel were found in a stratigraphically well-defined context. It was considered impossible that the association of these vessels and the sherds from the end of the Avar Period could be dated to the 11th-century (TAKÁCS 2009, 237).

The literature contains numerous other examples where the association of the two types in the same context was attested. For example, in Feature B/1993 at Tatabánya-Dózsakert “densely incised pieces and many sherds of various types of vessels with ribbed neck and of clay cauldrons with shell-shaped handle made on a slow wheel were found” (VÉKONY 2002, 32, 41, 5. kép). A vessel with ribbed neck made on a fast wheel was found together with the rim of a clay cauldron in the lower layer of Oven 3 in Trench 6 at Keszthely-Fenekpuszta (JANKOVICH 1991, 186, 192, 205, 9. kép 11). At Pápa-Hanta, the fill of Feature 1995/1 also yielded rim fragments of a vessel with ribbed neck and of a clay cauldron (ILON 1996, 302, 311, 1. tábla). This issue leads, however, to the problems of the classification and chronology of vessels with ribbed neck. In my opinion, in lack of a full catalogue of such vessels, it is impossible to date the type more precisely than these two centuries.

To determine the beginning of the use of Early Árpád Period clay cauldrons we need more regional studies and more secure chronological fix points than the ones mentioned above to be able to reach a conclusion.

At present it is not entirely clear whether the causes of the discrepancies between these opinions are really chronological differences, or differences in regional characteristics. It would be useful to examine the material of Late Árpád Period settlements to establish whether they are also characterized by

⁹ There is only a single rim of clay cauldron is known from the 10th–11th century settlement of Esztergom-Szentgyörgymező, see the material of Pit 14: Inv. nr. 82.49.11. The author dated it to the turn of the 11th–12th centuries with a single reference to FODOR 1977, 343, where jar-shaped clay cauldrons are discussed: LÁZÁR 1998, 29, Fig. 20. 1.

¹⁰ There is only one exception, in the fill of the grave of Dabas; the association of the find with the grave, however, has recently been refuted by L. Kovács (KOVÁCS 1985, 377).

¹¹ This buckle variant was dated recently by P. Langó to the 10th century (LANGÓ 2007, 250, Abb. 157).

a mosaic-like diversity as is assumed here for the Early Árpád Period (that is, can we talk about settlements with and without clay cauldrons in the later phases as well?). Without attempting to answer them, we have to mention other, fundamental questions as well that may help clarify these issues: Can we talk about regional workshops and generally what kind of organization may have been characteristic for pottery manufacture in the Carpathian Basin at that time? Should we expect specialization, as indicated by the technology of the clay cauldrons?

Even within the Little Hungarian Plain important regional differences can be observed regarding Early Árpád Period sites with clay cauldrons. It is accepted as a fact by most researchers that the ramparts of the fortified sites of the period of state formation and the first decades of the 11th century (e.g. Sopron, Moson) did not yield any clay cauldrons, although we should not draw far-reaching conclusions from this. Clay cauldrons were not found in any of the Early Árpád Period settlements of Sopron and its vicinity. We have to emphasize the low number of clay cauldrons dated to the Early Árpád Period: for example, at the 10th–11th-century site of Ménfőcsanak-Szeles, approx. 5% of the ceramic material is clay cauldron. Ca. one-third of the features at Ménfőcsanak, seven can be dated with garland motif or cog-wheel pattern, thus these can be placed with certainty to the 11th-century. With regard to the rest of features we can consider certain the two-century-long interval based on the typology of clay cauldron rims elaborated by M. Takács for the Little Hungarian Plain. We cannot date any of the clay cauldrons of the site to the 10th-century with certainty, but we have to emphasize that this is true for all other vessel types and decorative motifs as well, thus the possibility cannot be excluded.

Previous research thus indicates that based on the sites in and around Sopron and Győr, we have only one securely dated element: the appearance of the cog-wheel pattern in the 11th-century – and the spread of the clay cauldrons can probably dated to this period as well. Due to the low number of finds, however, the start of the use of the latter cannot be established yet.

Although it might seem evident, we still have to emphasize that the conquering Hungarians settled down in an area with mosaic-like diversity in terms of climate, vegetation, soils, morphology (SÜMEG et al. 2003, 51–52) and culture. Consequently, it would be a mistake to apply a uniform scheme for the whole Carpathian Basin. We can obtain reliable results only if we examine the internal chronology of each region.

Like in all other periods, it may happen here as well that the survival of local traditions and the regional different dynamics of the development of pottery manufacture create a situation where the ceramic material of the Carpathian Basin shows much greater vertical similarities than horizontal ones; e.g. the 10th-century pottery of a region might be more similar to the 9th-century material of the same region than the contemporary pottery of another region. As an example we may refer to the comparison of the decorative motifs used at two sites in the Little Hungarian Plain, at Bácsa-Szend Vid domb (9th–10th-century; TOMKA 1991, 56; TOMKA 2000, 13–14; TOMKA 2002, 139–140) and Ménfőcsanak-Szeles dűlő (10th–11th-centuries; TAKÁCS 2006, 538; TAKÁCS 2010, 5), to establish their chronological relation to each other. The method highlights the problems of the previous statements, but also the possibilities inherent in the separate study of selected motifs. I admit that the study of a single element outside the context of material groups, rim types, etc. may lead to erroneous conclusions. Nevertheless, we may still not consider this experiment – for the very same reason – useless. The large proportion of much more micaceous ceramic material from Bácsa, fired under reducing conditions, is different at the first glance from the material from Ménfőcsanak. It remains a question, however, whether this is caused by chronological difference or is connected to the difference between partly coeval manufacturing traditions. With regard to vessel types we can establish that at Bácsa (in primary contexts) the dominant type is the jar, while the Early Árpád Period features of Ménfőcsanak yielded three dominant types, the jar, the hand-wheeled clay cauldron and the baking bell; neither sites yielded handmade clay cauldrons. In my opinion it cannot be demonstrated beyond doubt that there was no chronological overlap between the two sites; that the settlement of Bácsa, which was certainly occupied in the 9th-century, did not survive into the 10th-century. The statistical study (chi-square test, *Appendix 2: Fig. 1*) of the decorative motifs used at the two sites indicate that at Ménfőcsanak the ratio of decorated vessels increased, although only slightly. At Bácsa we find more sherds decorated with line bundles or wavy line bundles, significantly less sherds with scrolls, much more sherds with the combination of wavy line and line bundle, more sherds with wavy line and much more sherds with densely incised scrolls than at Ménfőcsanak. The cog-wheel pattern is missing altogether from the primary fill of the features at Bácsa-Szend Vid domb.¹²

¹² Árpád Period and late medieval material is known from secondary contexts.

Now we have to reformulate the problem discussed so far: what is 10th-century pottery like? During our studies we could establish that based on the comparison of vessel forms and decorative motifs, 10th-century pottery can be more easily distinguished from 11th-century material than from 9th-century material. Based on this research we may say that there are two well-dated elements: clay cauldrons can be dated to the 11th-century and later and the cog-wheel pattern appears in the same century. We can date these ceramic finds to the 11th-century with some certainty, although they make up only a small portion of the ceramic material. The above-mentioned decorative motifs, which can be dated only to a longer time-span of two or three centuries, do not make it possible to properly distinguish between 10th and 11th-century pottery, sometimes not even between

9th and 10th-century pottery. Thus, we can talk about 9th-century, 9th–10th-century, 10th–11th-century and 11th-century assemblages, but not about an exact dating to the one hundred years of the 10th-century, at least in the case of settlement material.

The aim of this present study is to collect and evaluate the mostly intact ceramic finds from close contexts, i.e. from Conquest Period graves, dated to the 10th–11th-centuries by other finds, and to provide some answers to the questions raised by the study of ceramics from contemporary settlement contexts. Here the results of the first phase of the research, the analysis of 95 ceramic finds are published. The final aim of the research is to delineate the possibilities of dating both the survival 9th–10th-century settlements and those, which could have been the earliest settlements of the Hungarian Conquestors.

GENERAL DATA

The analysis of the area under study was carried out based on the relevant previous research (J. Kvassay's dissertation: KVASSAY 1982; KVASSAY 1984), through the collection, review and analysis of the data in the literature. I will attempt a classification of 10th–11th-century pottery from burial contexts based on technological investigations, the elaboration of a typological scheme and well-dated finds in burials. With regard to the technological investigations, I could work only with the vessels I had access to (95 exemplars). All the other conclusions are based on authentically excavated finds and contexts. Based on the available data I collected 84 sites with burials that contained clay vessels; of these, 127 graves from 74 sites were authentically excavated.

GEOGRAPHIC DISTRIBUTION OF GRAVES WITH VESSELS

Although we do not have published data on all the known 10th–11th-century sites, the following can be discerned from the literature: in Borsod-Abaúj-Zemplén County and the Slovakian part of the

Bodrogköz area 64 cemeteries are known (RÉVÉSZ 1992, 93; RÉVÉSZ 1996, 206; NEVIZÁNSZKY 1994, 174–175), of which ten had a burial with a vessel. Of the 24 sites in Transcarpathia, three have yielded a vessel as well (KOBÁLY 2001, 207–209, 213–219). In the Rétköz area six of the 30 Conquest Period cemeteries contained a burial with a vessel (ISTVÁNOVITS 2003, 354). In Hajdú-Bihar County, of the 78 registered cemeteries (NEPPER 2002, 15–16) 11 are relevant for our topic. In the area of Heves County, the custom of providing food in the grave was documented through the presence of a vessel in ten of the 45 10th–11th-century cemeteries (RÉVÉSZ 1996a, 256). In Nógrád County ca. 45 sites have been counted so far,¹³ of which only a single grave with a clay vessel is known. The new site registers of Szabolcs-Szatmár-Bereg, Jász-Nagykun-Szolnok and Pest Counties are not complete yet,¹⁴ thus we have only incomplete data from these areas (*Fig. 1*). Based on the ratio of the number of vessels in a cemetery (vessels from graves and stray vessels from the area of the cemetery) and the total number of graves, 18 cemeteries deserve attention in terms of the “frequency of graves with clay vessels”.¹⁵

¹³ I would like to thank J. János for this information.

¹⁴ MADARAS 1996, 80. Madaras registered 32 cemeteries of the elite and middle classes within the area of the county, but did not include commoners' cemeteries. The sites of the counties in question were last collected fully in 1962.

¹⁵ Kenézlő-Fazekaszug II: 5/25, Karos-Eperjesszőg III: 3/19, Streda nad Bodrogom-Bálványhegy/Bodrogszerdahely (SI): 2/11, Bodroghalom-Eresztvényhomok: 4/27, Dormánd-Hanyipuszt: 2+1/17, Karos-Eperjesszőg I: 2+1/13, Tiszaeszlár-Fenyvespart: 2/13, Szolnok-Ugar: 6/28, Miskolc-Repülőtér: 1+3/21, Karos-Eperjesszőg II: 10/73, Timár-Béke Tsz. I: 3/41, Eger-Szépasszonyvölgy: 2/36, Szob-Vendelin: 12/142, Szob-Kiserdő: 7/108, Kistokaj-Homokbánya: 4/79, Nagyhalász-Zomborhegy: 2/45, Törökszentmiklós-Szenttamás: 2/46. Name of site: number of graves with clay vessel/number of excavated graves. Only cemeteries or parts of cemeteries with more than ten graves were included, furthermore only those sites than yielded more than one vessel.

The proportion of graves with vessels at these sites fluctuates between 20% and 4%, while at other sites this number is even lower. These cemeteries, that are fairly rich in ceramic finds,

appear mostly in the Upper Tisza region, although two cemeteries each can be found in Heves County, the Middle Tisza region and around the poly mouth as well.

GRAVES WITH VESSELS AND SOCIETY

The social categorization of cemeteries is far from unproblematic (ISTVÁNOVITS 2003, 442–449; MADARAS 1996, 76; RÉVÉSZ 1992, 107; 2008), since the classic commoner–“middle class”–elite terms are not always usable, and research has already drawn a much more subtle picture. In my analysis I used the evaluation of the cemeteries and their analogies by the given authors, and carried out a relevant review based on data from 43 cemeteries. I tried to reduce somewhat the variety of terms (e.g. wealthy freemen, rich commoners) without impairing the whole picture. The following ratios can be discerned: 53% of the cemeteries with graves yielding vessels (23 cemeteries) belong to the commoners, 29% (12 cemeteries) belong to the “middle class” and 18% are cemeteries where elite burials were found as well. It has to be noted in connection with the latter that in the case of the richest cemeteries it was not always the wealthiest grave that contained the vessel (as in the case of the cemeteries of Szolyva, Streda nad Bodrogom/

Bodrogszerdahely, Besenyőtelek, Tiszasüly); often they come from the less wealthy graves of the community (e.g. in the cemeteries of Karos I–III, Kenézlő, Tiszabездé). If we map these data it becomes clear that in the Upper Tisza region, graves containing vessels are found in the cemeteries of the commoners and the elite as well. Among these there is a chain of commoners’ cemeteries (as far as the cemeteries of Gáva and Ibrány can be regarded as such) on the left and right banks of the Tisza: these are the cemeteries of Nagyhalász, Ibrány, Tiszabercel, Gáva, Szabolcs, Tímár and Tiszalök, where graves containing vessels were found. It has to be noted that these commoner cemeteries are not uniform in terms of burial rites and ceramic finds (decoration, base stamps). There is a group of cemeteries with clay vessels in Heves County that belong to the “middle class” (Aldebrő, Dormánd, Eger, Tiszanána). In the area of Pest and Nógrád Counties, the four cemeteries contained graves with vessels from all three social groups.

BURIAL RITES AND GRAVES WITH VESSELS

At the 74 sites under study, 127 graves could be evaluated with respect to burial rites. It has to be noted that 14% of these (18 graves) had been disturbed, 3% (4 graves) had been robbed and in the case of another 13% (16 graves) we have no data available on the issue.

In 33% of the graves with vessels of the region (39 graves) we have no data on the sex of the buried person. In 30% of the cases (37 graves) the vessel was placed beside a child, in 15% (18 graves) beside an adult man, and in 17% (21 graves) an adult woman. In another 2% the sex of the deceased adult was not determined (3 graves), in 2% it was presumably female, while in one case a vessel was placed into a double grave, where probably a man and a woman had been buried together (*Appendix 2: Fig. 2*).

After mapping the data we may see that the region of Heves County can be distinguished in terms of burial rite, since here vessels as grave-goods have been documented mostly in the graves of women and children (although in the case of

Besenyőtelek the other grave-goods imply a male burial, which indicates that statistics often show a clear picture only due to the lack of research). The other regions cannot be separated this easily in this regard.

In terms of the position of the vessel in the grave, in 24% of the cases (27 graves) we lack any information on the issue. In 35% (41 cases) the food in the vessel was placed near the head, in 27% (31 cases) near the legs, while in 4% (5 cases) beside the body. In the rest of the cases (10% – 11 graves) another seven placements were attested: in one case near the belly, once above the chest, while positions beside the knee, at the thigh, beside the arm and in the grave fill were each attested twice (*Appendix 2: Fig. 3*). If we compare these with the sex of the deceased, no correlation can be found. We could not find regional differences in ritual within the study area, and the position of the vessel in the grave is not uniform even in one cemetery (see e.g. the case of Ibrány-Esbróhalom, Karos-Eperjesszőg II or Szob-Kiserdő). Although at Tiszabura and to the south there are six

cemeteries (Tiszabura, Tiszaroff, Törökszentmiklós, Szolnok-Ugar, Zagyvarékas and Monor), where – except for a single case – the vessel was always placed beside the head, this observation cannot be generalized yet. S. Tettemanti's statement, according to which north and west of the Danube vessels were placed at the feet of the deceased, while in the Upper Tisza region, the northern Great Hungarian Plain and in the Danube–Tisza interfluvium vessels found near the head (TETTEMANTI 1975, 104) and the shoulders dominate, has to be modified in the light of new data.

With regard to other elements of the burial rite, in 40% of the cases (49 graves) simple extended inhumation was observed, while in 23% of the cases (28 graves) we do not have any information on the issue. In 10% of the cases (12 graves) horse burial was also attested, while in 13% (16 cases) one or both arms were bent. The remaining 14% (another 17 graves) belong to 13 other types: once the legs of the deceased were pulled up; in one case, the deceased was buried in a chambered tomb; in another coffin grave both arms were bent; one double grave has been documented as well; one grave was encircled with stones; in one case, a dog burial was documented as well in the grave.¹⁶ One grave had a side step and coffin, another a side step and a horse burial; one had a side-wall niche, another was similar but contained a horse burial as well; in two cases the deceased were buried in a coffin, in two other cases trepanation was observable on the skull of the deceased, while in three other cases trepanation and horse burial were both documented in the same grave.

The custom of bending the arms of the deceased is characteristic in certain graves, especially in the Upper Tisza region; we know of two cases in the area between the Hortobágy and Berettyó rivers, it appears in one grave near the Ipoly's mouth and once in Heves County. The custom does not seem to be present in the northern part of the Danube–Tisza interfluvium, except for Grave 9 at Visonta. Horse burial is also not characteristic for graves with vessels in the north Hungarian region, except for the grave of Besenyőtelek, although it does appear in other areas. Other provisions of food in the graves – animal bones or eggs – were found in 6% of the cases (7 graves) in the Upper Tisza region and at one site (Szolnok-Ugar) in the Danube–Tisza interfluvium.

With regard to the orientation of the graves, in 30% of the cases (36 graves) we do not have any information, while in 57% (69 cases) West–East orientation was observed. In 2% (2 graves) the burial has a Southwest–Northeast orientation, while

in 9% (11 graves) a Northwest–Southeast orientation was documented. Only in 2% of the cases (3 graves) was East–West orientation observed, which means that Graves 164, 251 and 255 at Ibrány, excavated by E. Istvánovits, are unique in the area. Another unique phenomenon was observed in Grave 164 at Ibrány: it belongs to that 2% (3 graves) of all cases where not one, but two vessels were placed in the grave (one at the head, the other at the feet) (ISTVÁNOVITS 2003, 353). This rite appears only in Grave II/32 at Kenézlő-Fazekaszug, where two vessels had been placed on the two sides of the head (FETICH 1931, 88); in connection with the graves excavated in 1937 at Streda nad Bodrogom, in lack of proper documentation it remains questionable whether the jar was found together with the vessel with ribbed neck or as a stray find.¹⁷ In Grave A at Tiszabura-Szőlőskert – where the authenticity of the excavation is doubted – a vessel with ribbed neck and a jar were found on the two sides of the head of the deceased (HORVÁTH 1934, 143). The two latter cases are not entirely securely documented, but had to be mentioned for the sake of completeness.

In connection with the topic I have to mention another phenomenon to which E. Istvánovits has recently drawn our attention (ISTVÁNOVITS 2003, 353). She interpreted ceramic sherds found in the fill of the grave or around it as an element of the burial ceremony. I could collect nine sites from the area under study where this had been documented (Bodroghalom-Eresztvényhomok, Ibrány-Esbóhalom, Karcsa-Kormoska, Kenézlő-Farkaszug I, Kóspallag-Kishantpatak, Szabolcs-Petőfi utca, Letkés-Téglaégető, Kistokaj-Homokbánya, Szob-Vendelin). Of the 24 burials one yielded a vessel as well (Bodroghalom-Eresztvényhomok, Grave 9). At Karcsa-Kormoska none of the graves contained vessels, but only in the case of one of the three (Grave 26) can we talk about contemporary sherds: the fragments from the fill of Graves 62 and 90 cannot be connected to the period under study. Nevertheless, the examples from Kóspallag, Letkés and Szob indicate that this ritual cannot be connected exclusively to the Upper Tisza region. I also have to note in connection with the fragment from Kóspallag that the half vessel found in Grave 1 and one of the fragments from Grave 3 show such a great similarity that they probably belong to the same vessel. When examining this ritual we have to be cautious with our interpretations, however, since it is quite possible that in many cases the phenomenon was not documented.

¹⁶ It has been suggested that the dog burial belonged to another period (KOVÁCS 1989, 171; BÁLINT 1971, 303–314).

¹⁷ I would like to thank G. Nevizánszky for this information.

DATING GRAVES WITH VESSELS

When dating the cemeteries, I took into account the evaluation of the excavators and the most recent dating proposals of specific object types. 30% of the graves with vessels did not contain any other grave-goods. Of the properly excavated sites with vessels from graves, 69 were accessible for study. In the following I will base my investigations and conclusions on these. It is important to emphasize: there are ca. 94%, that is, 98 10th-century graves belonging to the above mentioned 69 cemeteries. Besides, only 7 graves can be dated to the late 10th century – early 11th century.

The graves of sites with vessels fall into the following periods: 27 sites (40%) can be dated to the first half of the 10th century, and 21 (31%) cemeteries to the first two thirds of the century. The rest 13 cemeteries were dated to the second and/or last third of the 10th century.

From these data it is clear at the first glance that most of the vessels placed in graves in the region represent the 10th-century, a period that is difficult to distinguish from the preceding and following centuries at settlements.

TECHNOLOGICAL INVESTIGATIONS

I am of the opinion that the most thorough possible study of the past methods of pottery manufacture is important both from the point of view of the history of technology and chronology. In lack of pictorial and written sources in the Hungarian Conquest Period and the Early Árpád Period the issue can only be studied through the products themselves. Beside the pottery kilns (VÁGNER 2002) we have no other potters' tools¹⁸ or potters' wheels at our disposal.¹⁹ The technological study of the finds offers a number of possibilities, but also has many elements of uncertainty. In this paper I would like to present the results of the study of 95 intact vessels, which raise a number of questions in connection with ceramic technology as well.

1. MATERIAL GROUPS

With regard to the material of the vessels, as archaeometric studies on the pottery of the period have shown, in most cases we cannot assume intentional levigation and tempering (SIMONYI 2005, 43; SZILÁGYI et al. 2006, 62–63); real tempering and vessels made simply of the clay of secondary clay sources are very difficult to distinguish macroscopically, with the naked eye, consequently I did not attempt this. (This is the reason why I use the term “*sandy clay*” instead of “*sand-tempered*” when describing the vessels.) I could make some fundamental observations on the

vessels regarding their material, and distinguished three categories: 1. pebbly, sandy, micaceous, 2. sandy, micaceous, 3. presumably intentionally levigated and tempered.

During my studies I observed a phenomenon on the vessels that has been known in research for a long time (HOLL 1956, 177): it seems that the bases of the vessels always have a more coarse material, than the upper part, as hand-wheeling also affects only the rim of the vessel. Previously E. Simonyi suggested that such a manufacture of the vessels had static reasons (SIMONYI 2001a, 370), while M. Wolf noted that the cause may have been greater fire resistance (WOLF 2003, 87). Since archaeometric studies and their interpretations indicate that we cannot talk about intentional tempering in the period, both of these suggestions seem less convincing at the moment.

2. THROWING

Due to the considerable terminological confusion about throwing pottery in the literature, it seems prudent to briefly review here the meaning of various technological terms. The clarification of the meaning of the three basic categories (handmade, hand-wheeled and “*fast-wheeled*” vessels) became important during the study of the vessels placed in Conquest Period graves. Furthermore, it seemed reasonable to restructure the previous tripartite

¹⁸ As far as I know, there is only one published implement from Hungary (from the Ottoman Period), which can be interpreted as a potter's tool: a clay cutter from the castle of Ozora (GERE 2003, 51–52).

¹⁹ A find of a late medieval potter's kick wheel from Dortmund-Groppenbruch, Germany, is a unique find (BERGMANN 1993, 270–274).

system, and to talk about vessels made by hand, on the potter's wheel or with a mixed technology (Appendix 2: Fig. 4).

I. Handmade vessel

All vessels that had been built by hand, without the centrifugal force of the potter's wheel in all phases of the manufacture of the vessel, are considered handmade. These could be manufactured with various techniques, like the coil or spiral technique, slab technique (ORTON 1995, 117–120). The lack of bands and stripes, that would otherwise result from the use of the wheel, and the smoothed-over coils or spirals are easy to identify. In the material I studied, representatives of this technological group could not be observed, although it is admittedly difficult to distinguish on the basis of technological traces from vessels that had been wheeled on a tournette subsequently, discussed below.

II. Wheel-made vessel

The basic form is the so-called single wheel (RYE 1981, Fig. 58), with numerous variants.

*II/1. "Primitive wheel":*²⁰ During ethnographic research on Crete, Cyprus and in Messenia, Hampe observed a simple turntable (so-called *Handdreh- und Fußschubscheibe*) still in use in the 20th century, where hand-built vessels were partly formed on a small wheel, sitting on a low stool in front of the turntable, turning it with the toe or the heel (HAMPE–WINTER 1962, 93). This type of wheel could achieve only a slow rotation speed (HAMPE–WINTER 1962, 57). Vessels termed here "*hand-wheeled subsequently*" could have been made on such turntables (FIEDLER 1992, 122).

The four vessels in the study area (Káros-Eperjesszög II Grave 1, Hajdúszoboszló-Árkoshalom Grave 189, Ibrány-Esbóhalom Grave 1965, Visznek-Kecskehegy Grave 35; Fig. 2) all come from properly excavated and documented graves, thus their date in the period is beyond doubt. They are scattered throughout the study area. With regard to their material and technology, these artefacts in

question belong either to the group of I. or to the group II/1. The material of these vessels is the least homogenized, and their decoration has a higher "*amplitude*" (e.g. Visznek, Hajdúszoboszló) or is more irregular (Ibrány) than of those made on a hand-wheel. In all cases it can be assumed that the coils were placed upon each other, smoothed and then wheeled subsequently.

Vessels formed on a tournette in the final phase of the manufacture process, although they make up only a small portion of the material, can be regarded as evidence for the survival of earlier ceramic manufacturing technologies, especially if we think that these four sites include Visznek-Kecskehegy as well, where Grave 35, placed above the Avar Period cemetery, is part of the 10th-century grave group (RÉVÉSZ 2008, 380–381).

*II/2. Classic hand-wheel:*²¹ The hand-wheel consists of two stones and a pivot and a socket, or a wooden plank turning on a pivot. Its form is similar to real potter's wheel, but it is smaller, lighter and lacks a second wheel, consequently it cannot rotate as fast and provide such a centrifugal force as the kick wheel. It has to be born in mind, however, that for a shorter period it could reach greater speed (RICE 1987, 134). We can distinguish two basic types: with a fixed pivot (LÖBERT 1984, Fig. 1.; CERAMICA 2007, 181) and with a rotating pivot (LÖBERT 1984, Fig. 1; CERAMICA 2007, 182).

II/2.A group: the forming of a vessel on a hand-wheel built with coil technique; this makes use of the wheel's centrifugal force only in a single phase of the manufacture of the vessel. In connection with the medieval pottery of the Carpathian Basin, the technique was described by I. Holl based on Bosnian ethnographic examples. Traces of turning are clearly visible – especially on the upper part of the vessel, under the rim, both inside and outside – on vessels manufactured with this technique, beside the coil technique and the stamp or plank impression on the base.

II/2.A1 subgroup: traces of turning are visible in the upper part, on the shoulder;

II/2.A2 subgroup: traces are visible on the whole surface of the vessel.²²

²⁰ That is, tornio primitivo, hand-wheel, turntable, pivoted turntable, tour à main, tournette, torneta, torno lento, rueda baja, primitiv korong. See CAPRIO 2007, 176.

²¹ Also called tornio a mano, fast wheel, potter's wheel, stick wheel, tour de potier, tour à main, tour au bâton, torno de inerzia, torno de mano, handbetriebene Töpferscheibe, klasszikus kézikorong. See CAPRIO 2007, 179.

²² HOLL 1956, 185. The latter became possible through the development of the hand-wheel.

The majority of the vessels (91%; *Fig. 3*)²³ belong to subgroup II/2.A2. Here further division would be possible only in terms of quality, although this is a rather subjective criterion. This group is characteristic for the whole study area.

My observations on the technology of hand-wheeled pottery are similar to those of other specialists of the pottery of the period (PARÁDI 1959; SIMONYI 2005). The groove on the rim indicates good technology, but could be observed only on four vessels. The formation of grooves probably depended on the use of a more stable hand-wheel. Although ceramic lids are rare from the period (e.g. Borsod-Edelény: WOLF 2006, 53, 10. kép), a connection between the grooves and the lids cannot be excluded. (In the case of the vessel from Grave 4 at Tiszaeszlár-Újtelep some doubt must be raised regarding the conscious use of grooves, since here ca. two thirds of the inner rim was grooved; this seems to be more accidental than intentional.) The shaping of the profiles of the vessels also indicates good mastery of the craft, just like the cutting of the rim, while the rarely attested carinated rims indicate a good technique and a more stable wheel.

II/2.B group: Depending on the thickness and diameter/weight of the wheel and the size of the vessel (with a larger wheel or a smaller vessel) hand-wheels can be used to throw vessels.²⁴ Historical representations (RIETH 1939, Figs. 60, 57 and 59) and ethnographic parallels (HAMPE–WINTER 1962,

94) show that this can be solved with two persons, where one is rotating wheel, the other is building the vessel. The traces of drawing up and cutting are clearly identifiable.

We have to highlight the find from Nagyhegyes, whose archaeological context is unfortunately unknown, but could not be left out of this study because of its firm date in the 10th–11th-centuries. Regarding its technology it represents a transition, and its affiliation with group II/2.B is a possibility. The material of the vessel is much finer than the average 10th–11th-century pot, and seems to have been intentionally silted and tempered. It has a base stamp, the vessel is an extremely symmetrical and traces of horizontal cordons can be seen on the inside at the belly and neck of the vessel (*Fig. 4. 1*). The ridges on the inside of the vessel are not traces of coils, since – as mentioned in connection with the previous group – they are not vertically smoothed, and they are much more regular. The base stamp does not exclude the possibility that it had been thrown, since – as demonstrated above – this could have happened on a hand-wheel as well; at the same time, there will be examples below that fast-wheeled vessels can also have base stamps. Furthermore, it cannot be determined about the technology of the small jar found in Grave 39 at Kálmánháza-Vitézsor whether the intentionally silted and tempered vessel with a base stamp had been hand-wheeled or thrown on a hand-wheel. The find of Kálmánháza belongs

²³ Ágcsernyő-Nagyréti domb, Biel/Bély, Bodroghalom-Eresztvényhomok, Graves 9, 18, 20, 22, 24 and 25, Streda nad Bodrogom-Bálványhegy/Bodrogszerdahely I, Graves 1 and 7, Edelény-Semmelweis utca, Grave 7, Gáva-Vásártér, Grave 18, Ibrány-Esbóhalom, two vessels from Grave 164, Graves 165, 251 and 255, Kálmánháza-Vitézsor, Grave 39, Karos-Eperjesszög I, Graves 12 and 13, Karos-Eperjesszög II, Grave II/66, Karos-Eperjesszög III, Graves III/16, III/18 and III/19, Kenézlő-Fazekaszug II, two vessels of Grave 32, Graves 33, 37, 38 and 41, Kistokaj-Homokbánya, Grave 59, and two stray finds, Miskolc-Repülőtér, Graves 9, 11, 12 and a stray find, Nagyhalász-Zomborhegy, Grave 1908,B 1 (Jósa's Grave 3), Pap-Balázshegy, stray find, Rad-Cselédhomok, Graves 2, 8, 12 and two stray finds, Sárospatak-Baksatanya, Grave 3, Szabolcs-Petőfi utca, Graves 382, 387 and 389, Tarpa-Nagy-hegy, Timár-Béke Tsz. majorja I, Graves 15, 16, 24 and a stray find, Timár-Béke Tsz. majorja II, Grave 4, Tiszabercel-Ráctemető Graves 8 and 9, Tiszabездéd-Harangláb, Grave 3, Tiszaeszlár-Újtelep, Grave 4, Tiszatardos-Reviczky uradalom, Berekböszörmény-Pál dombja, Berekböszörmény-Református templom, Grave 1, Debrecen-Józsa, Clara Zetkin utca, Grave 23, Hajdúsámson-Majorsági föld, Hajdúszoboszló-Árkoshalom, Grave 147, Körösszegapáti-Pállapály, Grave 27, Nagyhegyes-Józsa tanya, Sárrétudvari-Hízóföld, Graves 88 and 190, Tiszabura-Szőlőskert dűlő, two vessels from Grave A, Tiszacsege-Rákóczi u. 24, Törökszentmiklós-Szenttamás, Graves 39 and 44, Monori erdő, Grave 4, Szolnok-Ugar (Lenin-Tsz), Graves 4, 5, 10, 14, 18 and 28, Üllő-Hosszúberékpéteri, two vessels from Grave 2, Aldebrő-Mocsáros, Grave 15, Dormánd-Hanyipusztá, Graves 6, 8 and a stray find, Eger-Szépasszonyvölgy, Grave 26 and a stray find, Kóspallag-Kishantapatak, Grave 1, Szob-Kiserdő, Graves 15, 23, 32, 41, 60, 73 and 77, Tiszanána-Csehtanya, Grave 4. Due to lack of space, the description of these vessels is not included here.

²⁴ HOLL 1956, 191: "Among foreign scholars Kostrzewsky (1925), Jakimowicz (1929), Knorr (1937), Rieth (1938), Holubowicz (1947) and Rybakov (1948) studied in detail the types and development of the hand-wheel. The – mostly ethnographic – material they had collected from the simple light wheel to hand-wheels enhanced with a lower cylinder and later by a cross-plank shows a huge diversity. In my opinion the archaeological material can be connected to these types only at a very general level, and a more detailed categorization is not possible yet. The finds in themselves do not always indicate the implements used, and as Holubowicz emphasizes: most scholars studying the potter's wheel do not know that a vessel can be turned and built on a hand-wheel as well (HOLUBOWICZ 1947, 9–10)." Bosnian ethnographic examples also prove this: HOLL 1956, 191, 182, 190, 24. kép d. A parallel from Novi Pazari: a wheel approximately 30 cm in diameter and 30 cm tall: KOLMETA 1954, 167–168, Tab. I–II; ORTON 1995, 122, Fig. 10. 3; ROUX 1990, 31–37, photo 1–9.

to a small group of vessels that have a groove on the inside of the rim, indicating a superior technology or a more masterful craftsman.²⁵

It is important to emphasize that the difference between two hand-wheels and the products manufactured on them can be huge. A heavier wheel would obviously turn faster and for a longer time than a smaller and lighter one (ORTON 1995, 124).

II/3. “Fast-wheel”:²⁶ We have to note that the term “fast wheel”, indicating a faster rotation, is used consistently to mean “kick wheel” in Hungarian research (HOLL 1963, 349). Nevertheless, I think that since this is a debated issue, the term needs further clarification.

A “fast wheel” is capable of more or less continuous fast rotation around an axis. The speed, rev and the wheel’s stability – the lack of deflection – are the key elements of the innovation. Two types can be distinguished: the so-called “stick-wheel” and the (foot-powered) “kick-wheel” (RICE 1987, 134). The latter type – in contrast to the previous ones – belongs already to the category of “double wheel” (RYE 1981, 74, Fig. 58). The velocity needed to pull up a vessel is 50 to 150 rotations per minute; it is inversely proportional with the diameter of the vessel. Thus, the building of the neck of a flask needs high speed, perhaps even 150 rotations per minute, while 50 rotations per minute or even less is enough to build the wall of a large vessel (RYE 1981, 74).

Thus, due to the new possibilities, clay was always thrown on this type of wheel, and then the complete vessel is cut off the wheel. The traces of this are easily identifiable, and it is also indicated by the symmetry of the product and the regularity of the decoration. (Fig. 5)

Another indirect evidence for pulling up vessels is the smooth, slipped surface: dry clay cannot be pulled up, and due to the centrifugal force, water leaves faster which leads to the overdrying of the vessel. It would also scour the potter’s hand (RICE 1987, 128–129).

We have to draw attention to the misunderstanding according to which since a vessel manufactured on the fast wheel has to be cut off from the wheel, it cannot have a base stamp. This is not always the case, as demonstrated by a flask from Szokolya,

now in the Hungarian National Museum,²⁷ or a base fragment from Sopron.²⁸ The vessel and the fragment had beyond any doubt been manufactured on a fast wheel (the traces of pulling up are visible on the inside of the neck, while the concentric circles left by wheeling are visible on the bottom), but still have a base stamp.

Among the grave vessels under study, three cases had been undoubtedly pulled up on the wheel, the significance of which will be investigated in more detail in the section “Technological conclusions”. These finds, due to the above-described reasons, cannot be unequivocally assigned to either group II/2.B or II/3. We have to note that even in the case of the unique amphora of Sósartyán, so far undoubtedly defined as fast-wheeled, there are no traces of cutting off the vessel.

II/4. “Mixed technology” – thrown neck and hand-wheeled body: In the archaeological material the use of more than one technology on a single vessel has been attested numerous times (ORTON 1995, 125; LÜDTKE–SCHIEZEL 2001, 976). This group is represented in my collection only by one vessel from Biel/Bély (Fig. 4. 2). The cylindrical ribbed neck had been thrown on a wheel (of unknown kind), and then attached to the body of the vessel built on the generally used hand-wheel. The two parts, one made of coils and then subsequently smoothed and the other, the neck, with the characteristic corrugations caused by pulling up on a fast-wheel, are clearly distinguishable. The vessel from Biel – about whose context we only know that it was a burial with a horse, but which is a typical vessel form of the period – displays clearly the traces of pulling up and the attachment of the two parts.²⁹ Beyond this, in a strict sense, we can assign to this group vessels with hand-wheeled body and unwheeled handle, e.g. from Hajdúsámson-Majorsági föld, Ágcsernyő-Nagyrétdomb, Tarpa and Tiszaeszlár-Ujtelep.

Technological variability (Fig. 4), however, is not an exclusive feature of this region in the period under study. Preliminary data indicate that e.g. the cemetery of Rusovce/Oroszvár yielded two vessels with subsequent wheeling,³⁰ although we have to mention that the complete lack of handmade vessels in the later Árpád Period is not completely proven

²⁵ BÁLINT 1991, 48–51. Cs. Bálint suggested in connection with the material of the settlement of Eperjes that grooves for lids – thus the lids and, consequently, a new cooking technique – could have spread due to Byzantine influence.

²⁶ Tornio a piede, kick-wheel, spindle-wheel, fly-wheel, foot-wheel, double-wheel, tour à volant, tour à pied, torno rápido, rueda de alfarero, fußbetriebene Töpferscheibe, gyorskorong. See CERAMICA 2007, 188.

²⁷ Szokolya, Borsod-Abaúj-Zemplén County. Inv. nr. 75/1933. MNM.

²⁸ Sopron, Templom u. 20., in the material of the burnt rampart (GÖMÖRI 2002, 67).

²⁹ The separate manufacture and subsequent attachment of the cylindrical neck and the body of the vessel was pointed out by N. Parádi to K. Mesterházy (MESTERHÁZY 1975, 102).

³⁰ 58.804.HM, 58.821.H., see Note 2.

either, as indicated above in connection with the baking bell of Békés-Ditér³¹.

Furthermore, we have to expect the presence of wheel-thrown pottery in other regions as well: traces of pulling up can be seen on the rim and neck fragments of a vessel with ribbed neck from the fill of Feature II/19 at Fertőszentmiklós-Szereti dűlő and on a neck fragment with cog-wheel pattern among the ceramic finds of House 8 (GÖMÖRI 2002).³² At the same time, in my opinion, traces of pulling up and cutting are visible on the churning vessel from Borsod-Edelény, just like on a jar unearthed at the 10th-century settlement of Sopron-Jereván (GÖMÖRI 2002, 150, Fig. 116). A wonderful example of Late Árpád Period finds is the fast-wheeled clay cauldron rim from Győr-Káptalandomb,³³ and a Late Árpád Period jar from Győr-Homokgödrök (TAKÁCS 1996, 176, Fig. 18: a Late Árpád Period variant of Type 1).

3. SURFACE TREATMENT

It can be observed in the settlement material of the period that the surface of the vessels was smoothed with wet hand or a wet piece of cloth, whose trace (a thin clay slip that peels off easily) is usually clearly visible. Scientific analyses, however, did not demonstrate the presence of a separate layer, thus this is not an engobe administered after drying (SIMONYI 2005, 46–47). Among the vessels from graves such a clay slip on the surface of the vessel appears rather on carefully smoothed pots, like the one from Nagyhegyes.

The only vessel with a polished surface dated with certainty to the period is known from Karos (Fig. 15. 1; TAKÁCS 2000, 9). According to

M. Takács, the presence of polished pottery can be demonstrated in all three phases of the 10th–14th-century ceramic material of the Little Hungarian Plain, although only in very small proportions. It has to be noted that the polished vessels of the Little Hungarian Plain are in no way connected to the polished vessels of the Saltovo-Mayatskaya or the Balkan-Danubian cultural complexes. He concludes, that it could be the evidence of the survival of a 9th-century technique in southern Transdanubia (TAKÁCS 2000, 33).

4. FIRING

During the macroscopic investigation of the vessels it could be established that most of them had probably been fired simply in a pit, neutrally;³⁴ the use of the potter's kiln can be assumed only in connection with one or two vessels with good quality tempering and even colour (Nagyhegyes: Fig. 4. 1, Kálmánháza: Fig. 18. 1).

I made some observations in connection with secondary burning as well. It is frequent that the vessel is burnt around the rim, which may simply be the trace of the food that had boiled in it. Generally, the body of the vessels is sooty to a certain extent, but – in a non-negligible number of cases – while the wall of the vessel shows obvious traces of secondary burning, the bottom of the vessel is the least sooty (e.g. Aldebrő, Visznek, Karos, Bodroghalom). This does not mean that the bottom of these vessels was not exposed to heat, only that what we see is not the burnt layer (soot), but a livelier colour due to repeated heating.

TECHNOLOGICAL CONCLUSIONS

From the point of view of research, the clarification of terminology is important, since on a small, but not insignificant, part of 10th–11th-century ceramic material the traces of pulling up are clearly visible. The question, whether the kick-wheel – indispensable for mass production – was already

in use, leads us further away. It seems certain that the technology was not really widespread until the 15th century (HOLL 1963, 349), although based on the finds it cannot yet be decided whether they had been thrown on a single wheel or a double wheel. Even if the first is the case, we are facing a

³¹ N. Parádi, Békés-Ditér, excavation documentation, Archives of the MNM Nr. 2000.VI./36 (82.1.1.B.MNM, 82.1.4.B).

³² GÖMÖRI 2002, 170–171, 174, Fig. 138. I would like to thank I. Holl for confirming the technology of the fragment with cog-wheel pattern.

³³ Győr-Káptalandomb, Trench 1974.1, -150–180 cm. I would like to thank P. Tomka for allowing me the analysis of the material.

³⁴ In a pit they are fired at a temperature of 700 degrees the most, and become spotty (KARDOS 1978, 49). Vessels with neutral firing are taken here to mean types that are spotty, thus a single vessel had been fired under both oxidizing and reducing conditions. I would like to thank P. Véninger for helping clarify the issue.

significant technological innovation that cannot be ignored. I list here four possible explanations of the phenomenon, taking into account the interpretative limitations of ceramics.

1. The vessels in question are all imports.
2. It is a survival of a technology present in previous centuries as well.
3. Technology transfer is behind the phenomenon whose source needs to be identified.
4. The technology is the result of an autochthonous development in the 10th-century Carpathian Basin.

Three finds among the vessels from graves can be assigned to the first group with certainty (an amphora from Grave 3 at Sósartyán-Murahegy (Fig. 26), a one-handled jug from Grave 66 at Karos-Eperjesszög, cemetery II. (Fig. 15. 1), and a handle-less vessel with ribbed neck from Grave 12 at Miskolc-Repülőtér (Fig. 16. 5), while the context of the fourth (a small pot from Grave A at Tiszabura-Szölőskert dűlő) remains uncertain.³⁵ The sites are geographically scattered, and the available meagre data do not indicate that these were the products of a single workshop.

The technology of the unique amphora from Sósartyán is special: it is a glazed vessel manufactured on a fast-wheel, probably an import. Its symmetry, material and execution clearly distinguish it from the other vessel made on a simple hand-wheel. Nevertheless, if we investigate the base of the vessel, that is, the bottom of the base ring, it is obvious that the vessel was not cut off, but simply lifted from the wheel. Manufacturing on a fast-wheel is not necessarily a surprise, given its probable Balkan origin. The first possibility can be ruled out in connection with the vessel from Miskolc, since in this period trade in pottery has not been attested yet in the region. Furthermore, its texture is not really different from that of the usual Árpád Period pottery. However, since no material analysis has yet been carried out on the vessel, its origin remains undetermined. Regarding the provenience of the jug from Karos, the results of the scientific analyses have not been published. The function of the vessel remains unclear, in lack of any analogies it cannot be determined whether it had been used for storage or not. The function and foreign origin of

the amphora from Sósartyán is obvious, and even if the technology of wheeling does not exclude the possibility of local origin, as mentioned above, the vessel form and the glaze clearly show connections beyond the 10th–11th-century material culture of the Carpathian Basin. When discussing this find, K. Mesterházy mentioned as analogies only amphorae from northern Bulgaria (Shumen, Pliska, Galishche, Preslav), but he drew attention to the higher quality of the vessel from Sósartyán (even glaze), based on which he suggested that the vessel was of Byzantine origin (MESTERHÁZY 1991, 168). According M. Takács, based on its size and shape it is a Bulgarian product, and no proper Byzantine analogy has yet been found (TAKÁCS 1997, 212). If we have a look at contemporary Byzantine pottery, a direct Byzantine origin can be excluded: on the one hand, no proper formal analogy can be found among 10th-century Byzantine amphorae (GÜNSERIN 1990, 20–46); on the other, the quality and material of the glaze of Middle Byzantine glazed vessels is very different from that of the Sósartyán vessel.³⁶ An exact analogy cannot be found among the contemporary amphoroid vessels of the Balkans either (ДОНЧЕВА-ПЕТКОВА 1977, 82–84; FIEDLER 1992, 147, Taf. 31; COMŞA 1980, 323), neither in terms of vessel form, nor decoration, although they are certainly closer to the exemplar from the Carpathian Basin than the Byzantine sherds. Thus, the object is presumably of Balkan origin, although in lack of exact analogies this cannot yet be proven.

Among the possible answers, the survival of the fast-wheel technology of the Late Avar Period and the 9th-century also has to be taken into consideration. The so-called yellow ware of the Late Avar Period was manufactured on the fast wheel (GARAM 1969, 232). Fast-wheeled pottery is attested sporadically in Late Avar Period settlements as well, e.g. at Gyoma, Site 133 (VIDA 1996, 329–330) or at Eperjes-Csikós tábla (BÁLINT 1991, 23, Taf. XVII. 9, 13). A few Mediterranean type flasks with polished surface are known from the Late Avar Period cemeteries of the Tisza–Maros region, e.g. from Graves 9, 12 and 14 at Pusztamérgeş (KÖREK 1945, 110–111, Table VII. 21, Table VIII. 15) and Szeged-Kundomb (MEIER-ARENDT 1985, 44, Abb. 35). Several fast-wheeled

³⁵ Due to the low quality of the documentation of the excavation, the vessel could not be entered into the catalogue and no conclusions will be drawn from it directly. It seems that some mix-up occurred in connection with the vessels, as two pots can be found under the same inventory number: one can be surely dated to the early Árpád Period, the other is the published cooking pot manufactured on the fast wheel.

³⁶ Based on the 10th–11th-century glazed vessels seen at the temporary exhibition of the Istanbul Museum (“*Gün Işığında, İstanbul’ un 8000 yılı, Marmaray, Metro, Sultanahmet kazıları*”) and the glazed fragments (stray finds and survey finds from Istanbul, etc.) in the collection of the BIAA. I would like to express my gratitude to Lutgarde Vanderput (British Institute of Archaeology, Ankara) for providing access to the Middle Byzantine ceramic material in the collection.

vessels can also be detected in the 8th–10th-century ceramic material of northwest Romania, e.g. the amphora from Ghenci-Lutărie (Hung. Gencs) or the finds from Lazuri de Beiuș (Hung. Belényesirtás) (STANCU 2000, 179–181). The technological diversity of the ceramic material found around the 9th-century potter's kilns (Features 296 and 297) was considered representative by the excavators (TAKÁCS–VADAY 2004, 21): beside hand-wheeled vessels, vessels wheeled subsequently and handmade pottery it contained, although only small proportions (four fragments), fast-wheeled ceramics as well (TAKÁCS–VADAY 2004, 32). This shows that the technology was present not only in the Late Avar Period, but in the 9th-century as well, which may shed new light on 10th-century ceramic technology as well. Thus, the possibility cannot be excluded that a ceramic manufacturing method, present before the Hungarian Conquest, survived into the 10th–11th-centuries.

In connection with the vessel with ribbed neck from Miskolc-Repülőtér, a methodological problem has to be raised. Even in such a small region within the Carpathian Basin, we cannot find two vessels with a cylindrical neck that would be each other's exact analogies. There are nine hand-wheeled and one fast-wheeled vessels in the north-eastern area (Fig. 10). Thus, a clear-cut definition has not yet been provided for the type, and the only common feature of the group is the cylindrical, ribbed neck. Consequently, when we are looking for the formal analogies, we find such a huge spatial and temporal distribution that the method itself has to be questioned. As a consequence, researchers practically found parallels wherever they looked for (MESTERHÁZY 1975; FODOR 1985; JANKOVICH 1994, 408–409; TAKÁCS 1997, 213; BÁLINT 2004, 39). This vessel form appears in Moldavia as well: a fast-wheeled vessel with a ribbed neck dated to the 6th–7th-centuries was published from Militari (COMȘA 1972, 10, Fig. 1. 5), but it is also known from the 10th–12th-centuries (ХЫНКУ–РАФАЛОВИЧ 1973, 169, рис. 5. 11). 6th–7th-century vessels with ribbed neck and handle are known from Merovingian row cemeteries in southern Germany as well, e.g. from Dittenheim (HAAS–GEBHARD 1998, 76).

In connection with the technology of the vessel with ribbed neck from Miskolc-Repülőtér,

I would like to take into consideration the possibility of technology transfer and review of the use of the fast wheel in various areas. In Byzantium, the use of the fast wheel was a widespread ceramic technology thanks to the survival of traditions from antiquity. The survival of this tradition can be observed in the wider Mediterranean region. According to U. Fiedler's research along the Lower Danube, the use of the fast wheel makes its appearance in the second half of the 9th-century, and some of the amphora-like vessels were already made with the new technology (FIEDLER 1992, 124). Fast-wheeled vessels are present, but only sporadically in Proto-Bulgar pottery (DONČEVA–PETKOVA 1990, 83–85, 89). Based on the material of a few sites we can expect fast-wheeled vessels in the 8th–10th-centuries in the area of the so-called Dridu culture/Balkan-Danubian culture as well (DONČEVA–PETKOVA 1990, 83–85, 89), and it is known from the southern part of the Crimea as well (BARANOV 1990, 35). The survival into the Middle Ages of the ceramic manufacturing tradition of antiquity can be observed not only in the Mediterranean area: for example, Roman ceramic traditions continue into the classic and late Middle Ages in the Rhine region, and different technologies are used beside each other, even in the same workshop (LÜDTKE–SCHIEZEL 2001, 98–99).

Ethnoarchaeological studies have investigated the process of technological changes, its causes and necessary elements. The phenomenon is governed by very complex social, economic, technological and cultural factors. The effectiveness of technology transfer depends on the intensity of the connection. Four basic types of connections were distinguished, of which in our case the first (indirect connection through a mediator) and the second (direct, casual contact) seem relevant (GELBERT 2001, 84–87). Thus, according to the third explanation, the technological innovation could have, in principle, arrived from these areas as well, either directly through the hands of craftsmen from these regions, or indirectly, through them as mediators.

The fourth explanation of the phenomenon would be the regional, autochthonous development of pottery manufacture, the possibility of which cannot be ignored.

CLASSIFICATION

Below I will provide a list of vessel forms, rim types, decorative motifs and base stamps that could be distinguished.

VESSEL TYPES

It is not my intention to determine exactly the function of the vessels, as it is not really relevant for my work. (Although the position of the rim and the function of the vessel are correlated to the extent that the more vertical the rim, the easier it is to drink from the vessel.) During classification, I avoided terms like “*table ware*”, “*storage vessel*” or “*cooking vessel*”, since these would be rather *subjective in the case of these finds*. Of all the finds I categorized, 82 vessels definitely date to the period under study.

Most of the material that I investigated is made up of jars (a main type distributed in the whole study area), which can be divided into groups based on the ratio of their height and largest width:

Type I: Jars

Subtype I/1: jars with wide mouth (6 vessels, Fig. 6) – Those vessels belong to this type on which the width of the rim is at least twice as much as the base diameter. Exemplars from this group are known only from the Upper Tisza region.

Subtype I/2: globular jars (14 vessels, Fig. 7) – The main feature of the vessels of the type is that the ratio of their height and their largest width is not more than one, that is, their width is larger than their height, their shape is globular or compressed globular. The type is attested in three areas: the Upper Tisza region, Heves County and the Ipoly mouth.

Subtype I/3: normal jars (34 vessels, Fig. 8) – The ratio of the height and largest width of vessels of Type I/3 is between 1 and 1.2, thus they are a bit more elongated than Type I/2. The distribution of the finds does not reveal any distinct spatial pattern, it is generally characteristic for the whole study region.

Subtype I/4: elongated jars (13 vessels, Fig. 9) – Vessels with a height/width ratio larger than 1.2 are assigned to this type. The distribution area of the type does not show any distinct spatial patterning. Beside jars we have four other major types: bowls, vessels with cylindrical neck, one amphora and one jug.

Type II: Bowls (Fig. 6)

Subtype II/1: flower pot shaped bowl (one vessel)

Subtype II/2: bowl with inverted rim (one vessel)

Type III: Vessels with cylindrical neck (Fig. 10)

Subtype III/1: Vessel with ribbed neck and handles (four vessels) – Vessels with cylindrical, ribbed neck and two handles on the shoulder are assigned to this type. Three of these vessels were found in the Upper Tisza region, one east of the Tisza River.

Subtype III/2: Vessels with ribbed neck without handles (five vessels) – Vessels with ribbed neck without handles belong to this type. Three of these vessels were found in the Upper Tisza region, two east of the Tisza and one at the Ipoly mouth.

Subtype III/3: Vessels with non-ribbed neck and with handles (two vessels) – Vessels with non-ribbed cylindrical neck and two handles on the shoulder belong to this category. Both known vessels were found in the Upper Tisza region.

Type IV: Amphora (one vessel, Fig. 26) – Two handled jar with a straight bottom.

Type V: One-handed jar (one vessel, Fig. 15.1.) – One-handed jar with narrow neck and globular lower part.

When we examine the distribution maps of the various types, no distinct patterns can be recognized. Only Type I/a seems to be an exception, but it needs to be investigated whether the different distribution area is caused by the low number of cases or we can really talk of a spatially distinct group.

THE CLASSIFICATION OF RIM TYPES

Four main types and 22 subtypes can be distinguished based on the shape of the rim (see Fig. 11).

If we look at the distribution maps of the various rim types (rounded, cut, tapering, carinated), the following conclusions can be drawn: Rounded rims are widespread throughout the study area (35.5% – 32 rims); this is the only known type in the northern part of Hajdú-Bihar County (Kálmánháza-Vitézsor, Debrecen-Józsa, Clara Zetkin utca, Hajdúsámson-Majorsági föld, Hajdúszoboszló-Árkoshalom, Nagyhegyes-Jónatanya), while in the southern part (Sárrétudvari-Hízóföld, Berekböszörmény-Pál

dombja, Berekböszörmény-Református templom) only cut rims have been found. Cut rims are frequent throughout the study area (45% of the rims that could be examined, 39 rims); it remains a question, however, whether this distinction within Hajdú-Bihar County is caused by the inadequacies of research or they reflect different potting methods. According to the available data, carinated rims (11% – 10 rims) are characteristic for the vessels of the Upper Tisza region (Tiszabездéd-Harangláb, Karos-Eperjesszög II, Ibrány-Esbóhalom, Tiszabercel-Ráctemető, Tiszaeszlár-Ujtelep, Kistokaj-Homokbánya), and are attested at one site in Heves County (Dormánd-Hanyipusztá). Tapering rims (three specimens) represent such a small proportion of the material that their distribution cannot tell us much. Grooves are also present in such a small ratio that drawing any conclusions based on them would be irresponsible; they may only indicate the level of technology.

DECORATION

The vessels from graves display the same decorative motifs that had already been discussed in connection with the chronological problems. Two motifs form exceptions: the cog wheel pattern and the, rather rare, simple garland. The latter is so rare that it can be considered a regional feature, but chronological inferences cannot be based on it.

Based on the available information the following groups can be distinguished among the combinations of the given decorative motifs:

- I. undecorated
- II. wavy lines on the shoulder. a.) running around; b.) incised spirally
- III. a.) wavy line bundle; b.) wavy line bundle with a straight line bundle underneath; c.) combination of wavy line bundle – line bundle – wavy line bundle
- IV. scroll on the shoulder, in the middle, on the whole vessel, incised densely
- V. a.) nail impression; b.) nail impression and scroll
- VI. a.) stabbed impressions – wavy line bundle – scroll; b.) stabbed impressions – scroll
- VII. a.) wavy line – scroll; b.) two wavy lines – scroll; c.) four wavy lines – scroll
- VIII. scroll – wavy line bundle – scroll
- IX. nail impression on the inside of the rim – on the side – in a scroll down to the bottom of the vessel
- X. bands made up of wavy line bundles.

Based on the decoration of the vessels I investigated or identified from drawings, the above variants could be distinguished. According to these data, 23% of all vessels were decorated with a wavy line bundle and/or line bundle.

This decoration, defined by research as a surviving element, is documented in the Upper Tisza region (Figs. 14. 4, 18. 4, 19. 2–3, 7) and in Heves County (Figs. 24. 2, 7, 25. 1). One vessel from Monor also has a wavy line bundle. Wavy line bundle is attested only once on the vessels from the area between the Hortobágy and Berettyó rivers (the above delineated “group with rounded rim” is also located in this area). Except for the Heves County region, this surviving element is not characteristic for the vessels of northern Hungary. When we examine the frequency of the incised scroll (30%) and the combination of scroll and wavy line, it seems to be present in every region (for instance Figs. 13. 4, 14. 2–3, 7). It is remarkable, however, that the separate use of the wavy line is characteristic only in the Upper Tisza region (for example: Figs. 14. 6, 15. 3) and east of the Tisza (Fig. 23. 2). Among the vessels I collected, only one exemplar from Eger-Szépasszonyvölgy is outside this area. We cannot draw any conclusions from the distribution of the small amount of stabbed impressions (2%, Figs. 20. 2, 24. 5) and nail impressions (4%, Figs. 22. 1, 18. 1, 24. 6), but it seems that stabbed impressions are characteristic only for vessels from the Upper Tisza and Heves County regions. With regard to decoration we have to note that the Bodroglók area of the Upper Tisza region shows the largest diversity, but all decorative motifs (wavy line bundle, line bundle, scroll, wavy line, stabbed impression and nail impression) can be found on ten vessels from Heves County as well.

Based on the study of rim types and decoration, there seems to be a similarity between the sites of the Upper Tisza region (Figs. 13–22) and Heves County (Figs. 24. 1–2, 4–5, 7, 25. 1–2). The above-mentioned “group with rounded rim” in Hajdú-Bihar County (Figs. 23, 24. 1). can be separated from these. The ceramic manufacture of northern Hungary (Figs. 25. 3–6) also seems to be different from that of the Upper Tisza region and Heves County, while the least information is available from sites in Jász-Nagykun-Szolnok County in the Danube–Tisza interfluvium (Fig. 23. 4) and in the southern part of Pest County due to the small number of finds. If the conclusions are correct, the question rises whether the cause is different workshop traditions or chronological differences.

The investigation of the position of the decoration brought the following results: decoration is present on the upper part of 17% of all decorated

vessels, in the upper third in 18%, in the upper two thirds in 18%, in the upper three quarters in 11%, in the upper four fifth in 17%. Decoration was present in the upper quarter in 2%, in the middle half in 9% and in the mid-third in 8%. This can be basically compared with the tendency demonstrated by E. Simonyi in settlement materials, according to which 10th–11th-century vessels were usually decorated in their upper two third; she considered frequent

incised single wavy lines on the shoulder of the vessel, nail impressions or, more rarely, dot-like impressions, under which densely incised scrolls run down to the lower third of the vessel (SIMONYI 2005, 48). The cog-wheel pattern seems to be widespread from the 11th-century (TAKÁCS 1996a, 340) probably from the second half of the century, based on the vessels from graves in the study region, where this kind of decoration does not occur.

TPOLOGY OF BASE STAMPS

In the study region we know the most about the base stamps of Borsod-Edelény in the 10th-century (WOLF 2006, 53–54; WOLF 2009, 34), although they are generally present on some of the vessels throughout the Árpád Period. It seems that their distributions reflect some regional characteristics: compared to other regions, their number in Northern-Hungary seems to be rather high, while they are almost completely absent from the 10th–11th-century ceramic material of Veszprém County (TAKÁCS 1996b, 335), and they are also quite rare in the southern Little Hungarian Plain

(TAKÁCS 1993, 217). About one third of the vessels from graves in the study area had a base stamp or some kind of a trace of it (blurred stamp or impression of a plank or an axle).

The distribution of the types only shows that – due to the law of large numbers – the diversity of the base stamps from the Upper Tisza region is the highest, thus in theory they can be connected to all the other three regions. The finds from northern Hungary all belong to a single type (encircled cross).

CHRONOLOGY

We have to emphasize that since chronology is based on the dating of graves with vessels, the results cannot affect ceramic chronology generally, especially not in the whole Carpathian Basin. We do hope, however, that it may provide a guideline for further research. So far only four graves with vessels have been dated by a coin,³⁷ as indicated already above; in the rest of the cases we have to rely on the chronology of the associated finds and the various phases of the given cemeteries. This is an attempt to sketch the temporal tendencies observed among the vessels from graves in the study region, but it is by no means suggested that it will be possible to date an archaeological feature through pottery as precisely as the third or quarter of a century (*Fig. 12*).³⁸

In the following I will review the 78 datable vessels from authentically excavated graves available for study, arranged into chronological groups based on the cemeteries or excavated parts of cemeteries.

Regarding their typology, among the 25 vessels datable to the first half of the 10th-century, all four jar types are attested; the jug from Karos and the vessel with cylindrical neck from Streda nad Bodrogom can also be assigned here. In terms of technology, the group contains vessels formed on a tournette (Karos II Grave 1, Hajdúszoboszló-Árkoshalom Grave 189), one fast-wheeled and 22 hand-wheeled vessels. Seven vessels are decorated by scrolls and scrolls in bands, five by the combination of wavy line and scroll, three by wavy line, three by wavy line and line bundle. 29% (seven exemplars) of the vessels dated to the first half of the 10th century are undecorated. In 13 cases the upper half of the vessel is decorated, in three cases the upper two thirds, in one case almost the whole surface of the vessel is decorated, and in one case the decoration is in the middle half.

The vessels of the group dated to the first two thirds of the 10th-century are all hand-wheeled. The 14 jars in the group represent all four jar types;

³⁷ Karos-Eperjesszőg II Grave 1, Kenézlő-Fazekaszug II Grave 37, Tiszanána-Csehtanya, Grave 4, Tiszasüly-Éhhalom, Szob-Kiserdő, Grave 60.

³⁸ I would like to thank here my supervisor, T. Vida, and I. Feld for their suggestions regarding the chronological chart and an earlier version of the text.

furthermore, the group contains a handled vessel with ribbed neck and a handled jar. The vessels are decorated with wavy line bundles and line bundles in five cases, with scrolls on two vessels, and the combination of wavy line and scroll on two vessels. Five vessels remain undecorated. In three cases the decoration is positioned in the upper half of the vessel, in five cases in the upper two thirds, while in two cases in the upper three quarters.

Within the group dated to the second and last third of the 10th-century, consisting of an unhandled vessel with ribbed neck and ten jars representing all four jar types, ten vessels were hand-wheeled, while one was wheeled subsequently on a tournette. Two vessels are undecorated, two vessels are decorated with wavy line bundle and line bundle, four with wavy line and scroll, and four with scroll. In three cases the decoration is located in the upper half, in four cases in the upper two third, while in three cases in the upper three quarter of the vessel.

Only two vessels from the study area can be assigned with certainty to the group dated to the last third of the 10th-century. Both are hand-wheeled and represent jar Types 2 and 3. One is decorated with wavy line and scroll on its whole surface, while the other has nail impressions and scroll on its upper half.

Vessels that cannot be dated more precisely within the 10th-century include four jars from Type 2, one from Type 4 a bowl and a handled vessel with ribbed neck. The bowl is undecorated, two vessels are decorated with wavy lines, two vessels with wavy line bundle and line bundle, one with wavy line and densely incised lines, and one with scrolls in a band. In two cases the decoration is located in the upper half of the vessel, in one case in the upper two third, while in three cases in the upper four fifth of the vessel.

Vessels dated to the end of the 10th or the beginning of the 11th-century are represented by nine jars (Types 1–3), a bowl with inverted rim, a vessel with ribbed neck and the amphora. In four cases they are decorated with scrolls, in six cases with the combination of wavy line and scroll, and in one case with the combination of stabbed impressions and scroll. In seven cases the decoration appears in the upper half of the vessel, in one case in the middle, in two cases in the upper two third, and in one case in the upper four fifth.

Vessels dated to the mid-11th-century are represented only by three vessels from Szob-Kiserdő, of which only the bowl with inverted rim is intact. Their decoration includes the combination of wavy line and scroll, and scroll on its own.

VESSEL TYPOLOGY, DECORATION TYPOLOGY AND TECHNOLOGY IN THE LIGHT OF CHRONOLOGY

Since the groups are not represented by a large number of vessels, the finds of even one newly excavated cemetery can easily transform the results that can be reached at this moment. Nevertheless, it may still be useful to draw some conclusions.

The four main types identified are present among the vessels dated to the first half, the first two thirds and the second and third thirds of the 10th century. Type 4, jars with elongated body, are not attested among the nine jars dated to the end of the 10th, beginning of the 11th century. Of course, this tendency – the disappearance of the elongated type from the four jar types characteristic for the 10th-century by the turn of the millennium cannot – be generalized based on these data alone. Datable vessels with cylindrical neck and handle are represented by two exemplars altogether (Streda nad Bodrogom-Bálványhegy, Grave 1 [Fig. 16. 2] and Tiszaeszlár-Újtelep, Grave 4 [Fig. 22.4]); both can be dated to the first half or first two thirds of the 10th century. The two exemplars with ribbed neck from Hajdúsámson (Fig. 23. 6) and Tarpa (Fig. 21. 2) can be placed to the first two thirds of the 10th-century and generally to the 10th-century.

Their handleless variant is also represented by two datable finds: from Tiszabura (Fig. 23. 4), where the cemetery can be dated before the end of the 10th-century, and from Miskolc-Repülőtér (Fig. 16. 5), dated to the end of the 10th, beginning of the 11th-century. We cannot regard the chronological position of these four vessels as a tendency, and further finds are needed to confirm whether the two variants can really be differentiated chronologically. Due to the rarity of the jug, the amphora and the two bowl types we cannot draw any general conclusions from the collected data.

With regard to the decoration of the vessels we can establish that wavy line bundle and line bundle is attested only on two vessels in the group dated to the first half of the 10th-century, while it is present on 31% of the vessels dated to the first two thirds of the century. The decoration survived into the last two thirds of the century as attested by three vessels. Among the other six 10th-century vessels two jars are also characterized by this feature. The scroll is attested throughout the century and also on seven vessels dated to the end of the 10th and beginning of the 11th-century. The combination of wavy line and

scroll is also present throughout the 10th-century. Wavy line on its own is one of the rarest decorative motifs; it is attested on three jars from the first half of the 10th-century and on three vessels dated to the 10th-century; otherwise it is absent. Stabbed impressions and nail impression are too rare to base any conclusions on. It is striking that in the 10th-century 25–30% of the vessels lacked any decoration, while from the end of the 10th-century undecorated vessels disappear from the study area. With regard to the place of decoration, in the 10th–11th-century the upper half or upper two thirds of the vessels are decorated, but in about 10% of all cases the decoration covers two thirds or almost the entire surface of the vessel.

In connection with the manufacturing technology of the vessels we can establish that in the groups dated to the 10th-century thrown, hand-wheeled and subsequently wheeled vessels are all present; from the end of the 10th-century, vessels made on a tournette are not attested in the studied group. (The vessels manufactured with mixed technology and on the hand-wheel cannot be dated properly due to the insecurities of their archaeological contexts.)

As seen above, we have less information on vessels from graves from the 11th century on, since only 4% of the available vessels can be dated to this period.

VESSELS FROM GRAVES IN THE LIGHT OF SETTLEMENT CERAMICS

One of the main aims of this research is to find the common denominator between the burial and settlement pottery of the period. It is my suggestion that intact or reconstructible vessels from close contexts – in possession of the appropriate amount of information – can provide a control for the much more fragmentary settlement material.

I would like to mention two well-dated, 10th-century settlement ceramic materials from the region that I was able to examine in person.

Szicszó-Vadász patak is probably a special settlement type, where two intact vessels had – presumably – been deposited as markers of territorial boundaries, which I could examine in person.³⁹ M. Wolf interpreted the assemblage as boundary markers contemporary with the graves, and places them based on their context to the 10th-century (WOLF 1993, 545–548). Regarding their decoration, the vessels under study do not differ from some of the 10th–11th-century vessels from graves, although I have to mention that among these vessels only one of the jars had decoration on the inside of its rim. The internal decoration of the vessel from Grave 44 at Törökszentmiklós-Szenttamás is unique in another sense as well: instead of a wavy line bundle, it has nail impressions with large arcs on the inside of the rim, for which no analogies could be found yet.

The ceramic material of Borsod-Edelény contains jars with archaic, 10th-century form and decoration (the excavator believes to have found parallels in the pottery of the 10th-century settlements of Esztergom and Örménykút, and the decorative motif

of wavy line bundles can certainly be dated to the 10th-century), and the excavator also suggested that strong Saltovo influence could also be observed: a pithos would suggest this. According to M. Wolf's research, the published pottery and stratigraphy⁴⁰ date the settlement with certainty to the 10th-century, basing her above-described theory on this (WOLF 2003, 95–100).

The vessel forms, rim types, decorative motifs and materials of contemporary settlements show a picture similar to that of the vessels from graves. As J. Kvassay also stated, the difference is in their size, since the mean height of vessels from graves is smaller than the mean height of vessels for everyday usage (KVASSAY 1982, 19). The histogram showing vessel volumes on *Appendix 2: Fig. 5* is also an illustration of this. Although scientific analysis has not yet been carried out on the vessels I studied, all seem to have been fired at an appropriate temperature, which does not indicate that these had been manufactured for burial. A few examples may weaken this argument (Karos-Eperjesszőg III/19 vessel, Ibrány-Esbóhalom Grave 165), there is, however, not enough evidence to assume that pottery was manufactured specifically for burial in the 10th–11th-centuries. Traces of secondary burning and the use of grooves for lids all suggest that these were implements used for cooking. The material from Edelény also contained a number of vessels with the archaic decoration on the inside of the rim (wavy line bundles), whose lack on the vessels from graves in the region has already been pointed out.

³⁹ I would like to thank M. Wolf for drawing my attention to this material and made it available for study.

⁴⁰ The stratigraphy of Borsod has been critically reviewed recently by M. Mordovin: MORDOVIN 2010.

SUMMARY

My work was an attempt to sketch various tendencies and regional differences based on the study of vessels from graves in the study region. Based on the currently available evidence, in the light of available authentic excavations and the number of vessels, the task is not unproblematic, and obviously the observer influences the observation.⁴¹ The statements, that in the course of time an increasing number of vessels were decorated (most of the vessels dated to the first half of the 10th-century are undecorated) and that by the turn of the millennium the elongated jar type disappears, still remain uncertain, especially in the light of the fact that in the 11th-century much less vessels from graves represent the pottery manufacture of the period than in the 10th-century. With regard to the manufacturing technology of the vessels, the phenomenon observed in the study area, that we cannot expect vessels made on a tournette in the 11th-century, also seems incidental. This technology appears sporadically in the 10th–11th-centuries, and we can assume its gradual disappearance with time. In the light of the examination of decoration it is striking that the wavy line and wavy line bundle motifs, which are survivals from the previous period, are present to a certain percentage, except for the area of the modern Hajdú-Bihar County, where the motif appears only on the vessel from Bihar. Based on the available data and the dating provided by metal objects, the appearance of the wavy line as the single decoration on a vessel is confined to the first half or two thirds of the 10th-century and is a rare phenomenon. But we have to take into account regional differences to an increased extent. If we look at this motif in the material of the Little Hungarian Plain, we can see that it still exists in the first half of the 12th-century (see the vessel of the already-mentioned coin find of Mosontétény). Decoration appears more frequently in the upper two thirds of the vessel from the last third of the 10th-century than in the first half or first two thirds of the century, when incised decoration on the upper half or just the shoulder of the vessel seems to be more common. This is, however, only an uncertain conclusion based on a small number of finds. It is important to emphasize that based on the finds available to me for examination it can be stated that the cog-wheel pattern is not

present in the 10th-century. This result is in conformity with the results of settlement research. We cannot ignore the fact, however, that internal decoration on the rim of the vessels is represented east of the Danube only by the vessel of Grave 44 at Törökszentmiklós-Szenttamási, although this find is unique anyway because of the decoration on the inside of the rim (nail impressions), as opposed to the settlement ceramics of the study area.

I tried to create regional divisions based on rim shape, decoration, vessel typology and the distribution of base stamps. The material is the least representative in modern Pest and Nógrád Counties, while the most vessels come from sites in the Upper Tisza region. This should hold us back from drawing wide-ranging conclusions. A certain similarity between the vessels from the cemetery of the Zemplén and Heves regions (indicating maybe some sort of connection?) can now be outlined, although this may be only the result of the extent of research. With regard to the regional differences of the Hajdú-Bihar County area (the single occurrence of the wavy line bundle decoration; the use of rounded rims in the north, cut-off rims in the south), we have to bear in mind that this might also be the result of the inadequate number of finds. Based on the vessels (or maybe only due to the low number of vessels?) it seems that other regional differences, as mentioned above with regard to metal objects or the clay cauldrons of the Little Hungarian Plain, cannot be established (TAKÁCS 1993).

In the future, the collection and evaluation of the material from the whole Carpathian Basin and the new results of settlement research may help us answer numerous questions, refine chronology, delineate regional differences or investigate whether the territory of identifiable workshop areas coincide with metallurgical regions. A complete material collection will hopefully provide more clues to decide whether there indeed are traits characteristic only for the 10th-century, to distinguish the settlements of the first century following the Hungarian Conquest, and to date the traces of the earliest settlements of the Hungarians in the Carpathian Basin.

Translated by Vajk SZEVEÉNYI

⁴¹ Tendencies are similarly difficult to identify in the case of Avar Period vessels from burials, even in an apparently optimal situation. See FIEDLER 1992b.

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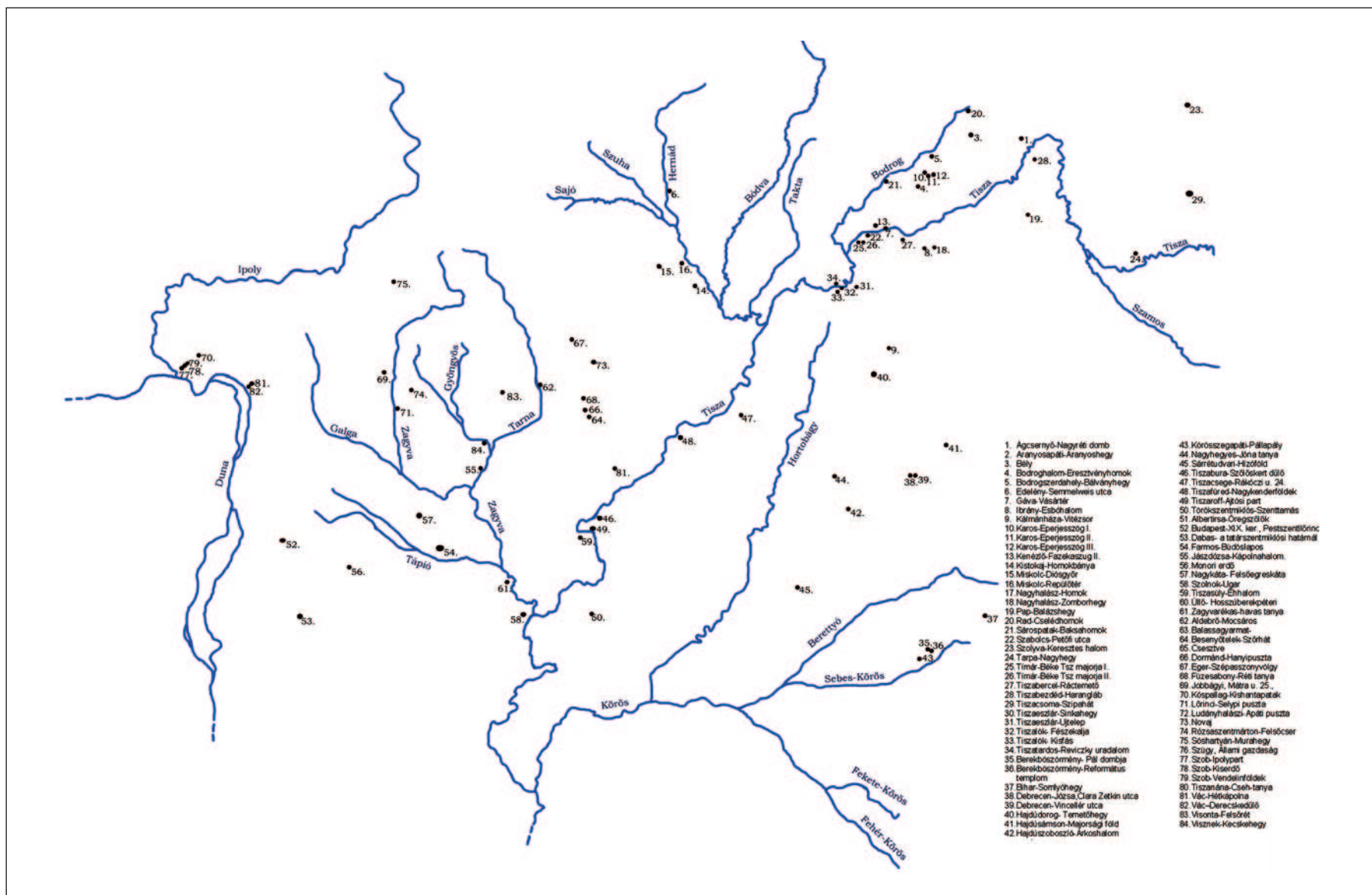


Fig. 1: Geographic distribution of graves with vessels dated to the 10th–11th-century



Fig. 2: I/1. wheel-made technology group (vessels made on "primitive wheel"). 1: Visznek-Kecskehegy, Grave 35; 2: Hajdúszoboszló-Árkoshalom, 189 Grave; 3: Karos-Eperjesszög II, Grave 1; 4: Ibrány-Esbóhalom, Grave 165



Fig. 3: II/2. A wheel-made technology group (vessels made on classic hand-wheel)



1



2



3



4

Fig. 4: 1, 4: II/2.B wheel-made technology group (vessel thrown on hand-wheel): Nagyhegyes-Józsatanya; 2–3: III. wheel-made technology group (“mixed technology”: thrown neck and hand-wheeled body): Bély



Fig. 5: II/3. wheel-made technology group (vessels thrown on “fast wheel”): 1: Sóshartyán-Murahegy, Grave 3; 2: Karos-Eperjesszög, II, Grave 66; 3: Miskolc-Repülőtér, Grave 12

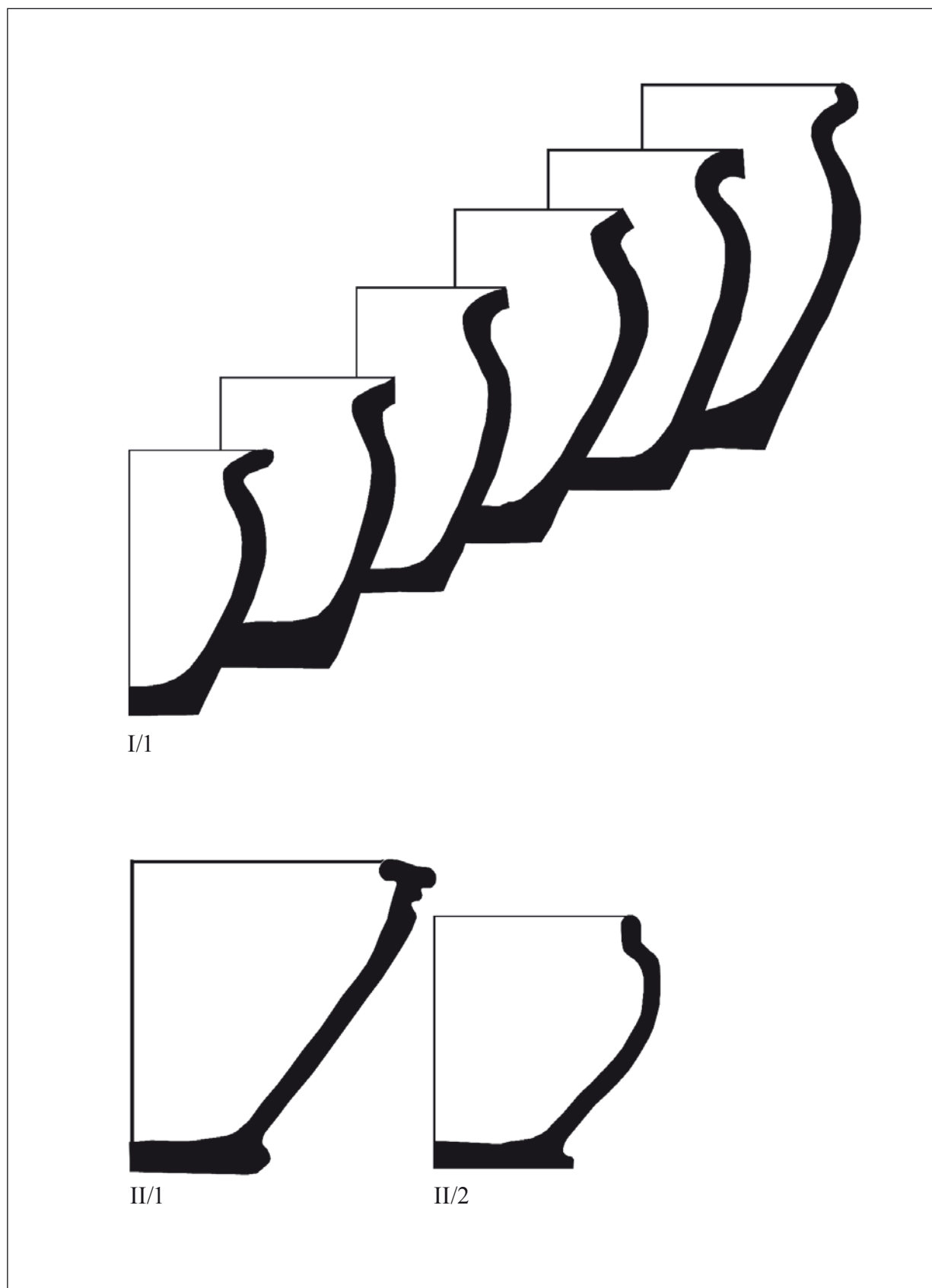


Fig. 6: Types of the jars and bowls: I/1: jars with wide mouth; II/1: flower pot shaped bowl; II/2: bowl with inverted rim

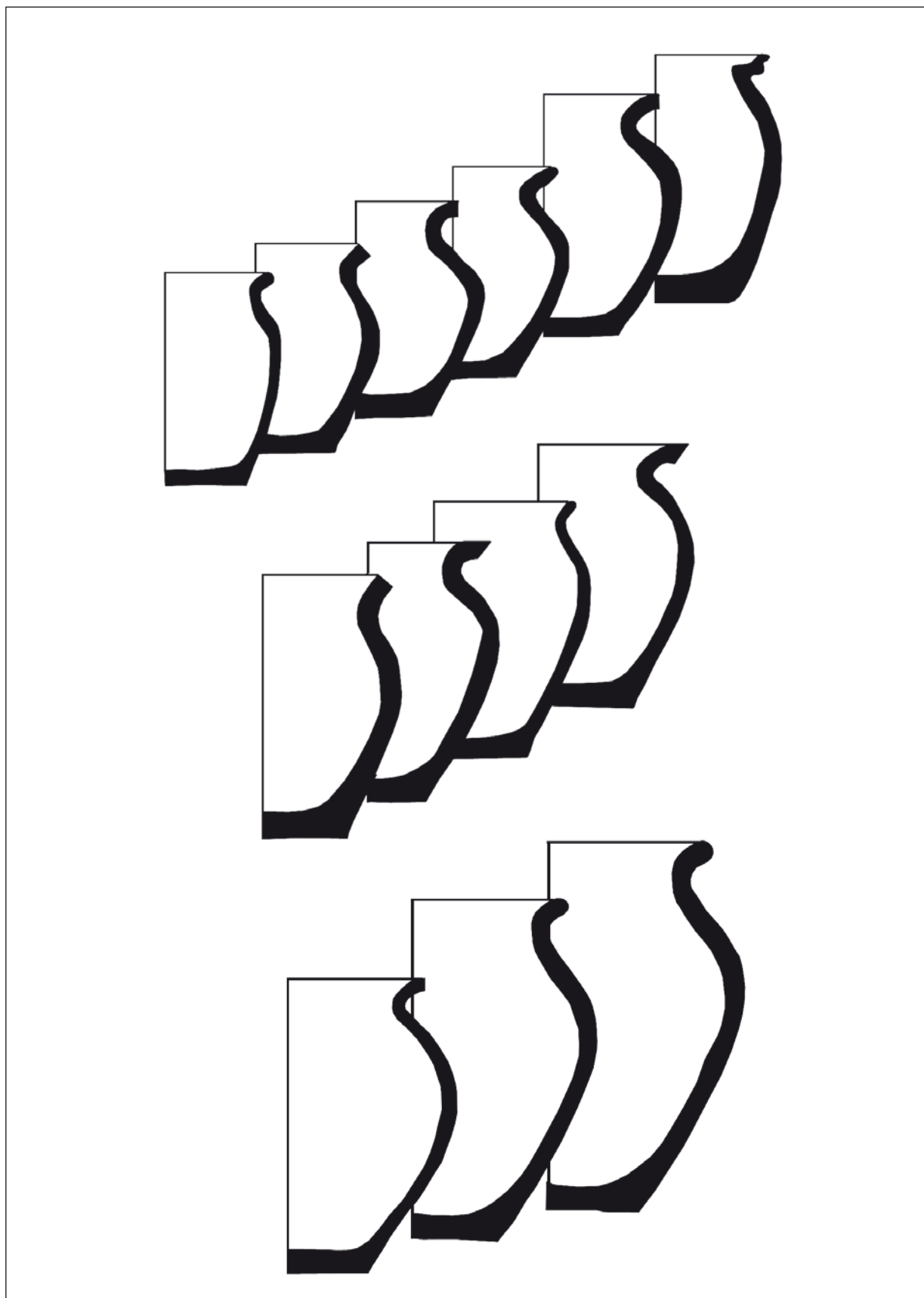


Fig. 7: Types of globular jars

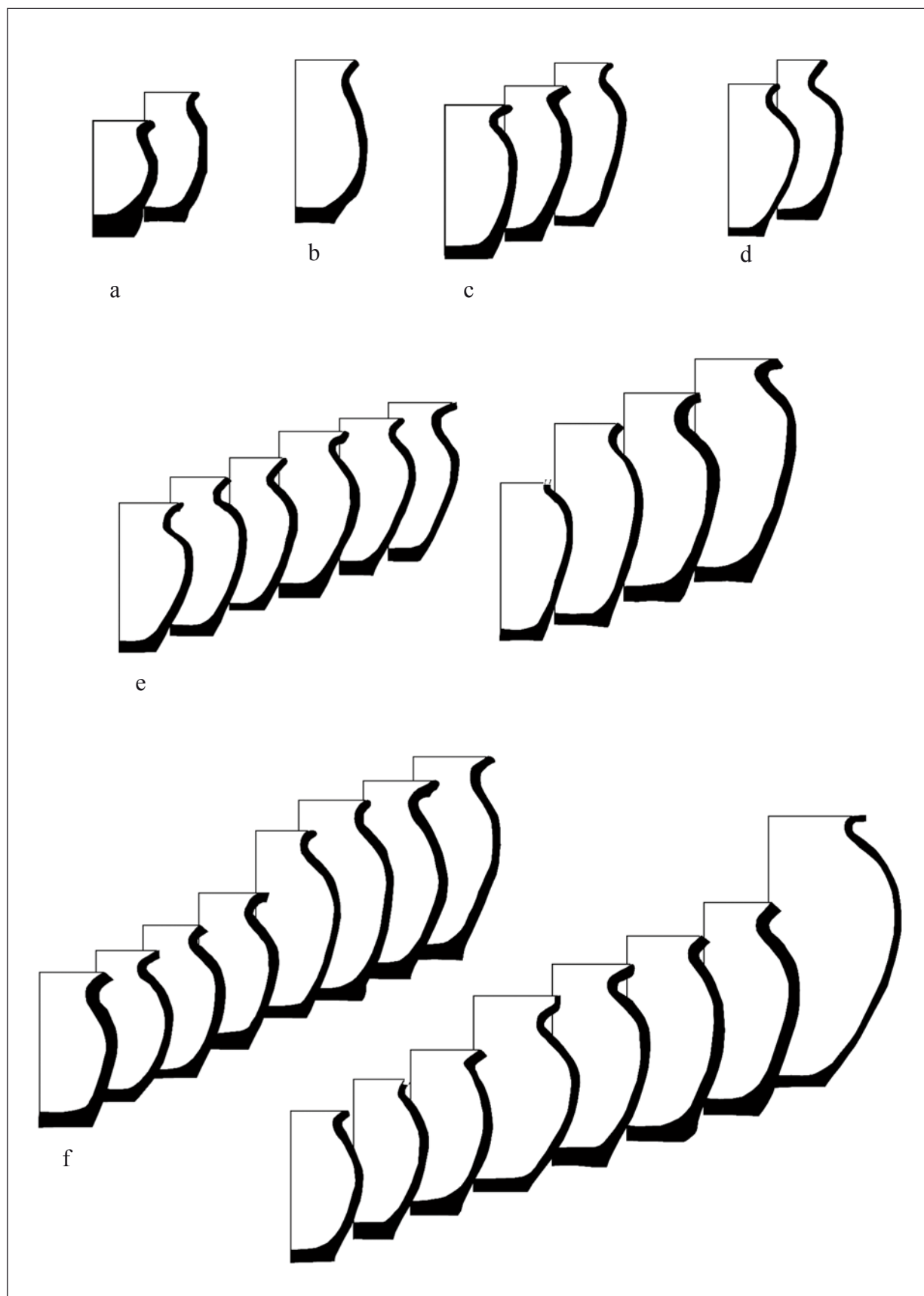


Fig. 8: Types of normal jars

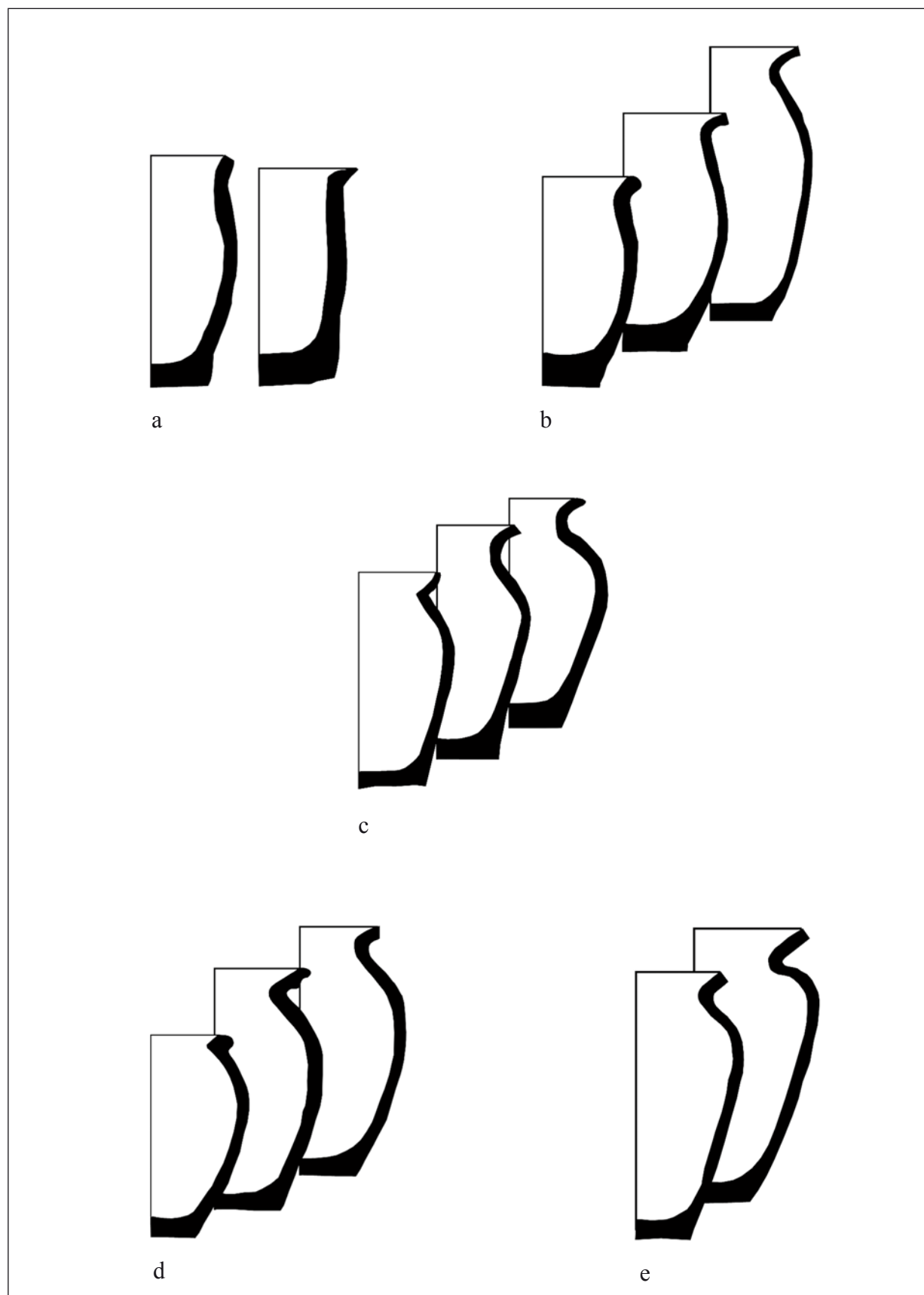


Fig. 9: Types of elongated jars

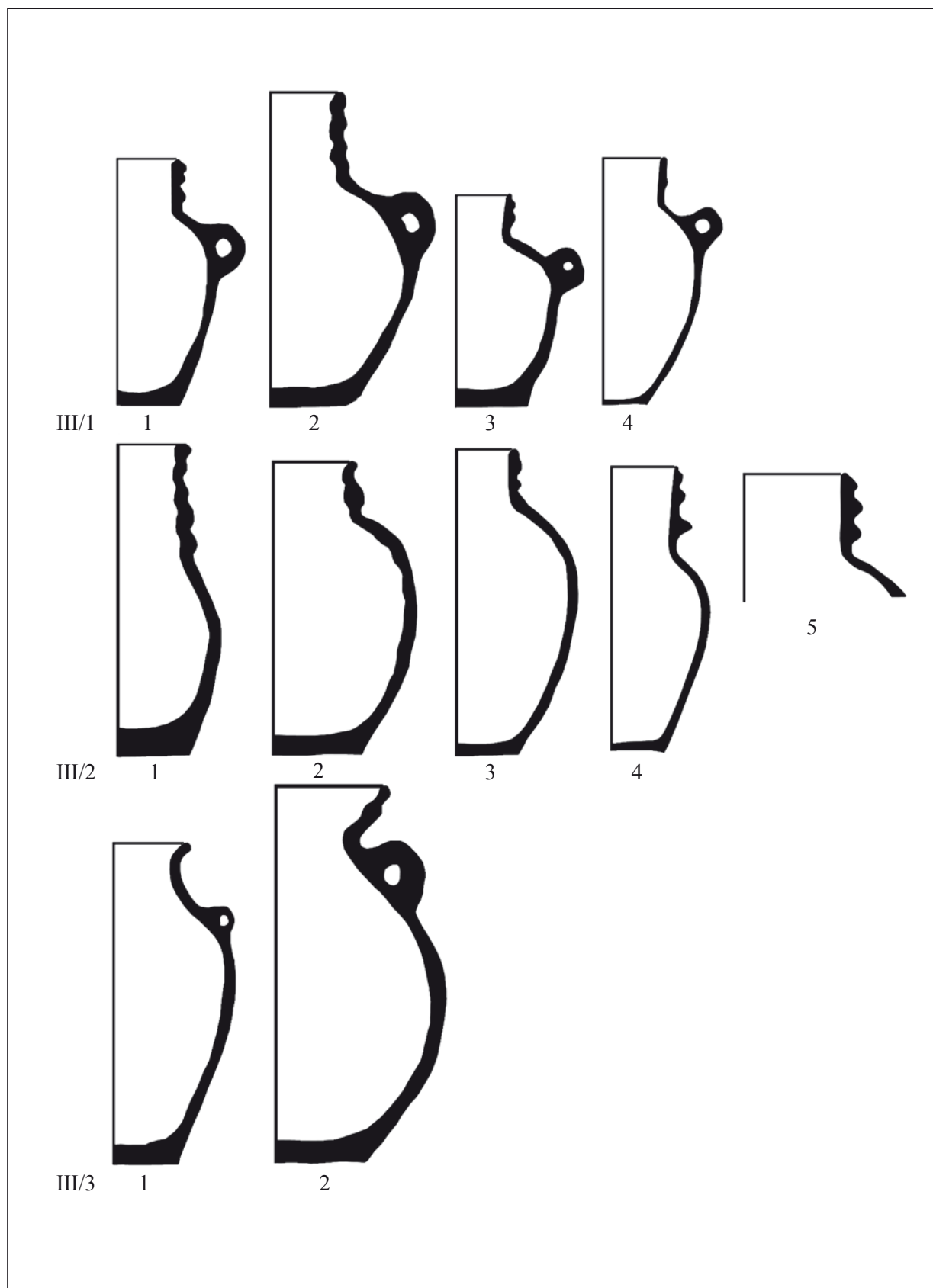


Fig. 10: Types of vessels with cylindrical neck: III/1: Vessels with ribbed neck and handles; III/2: Vessels with ribbed neck, without handles; III/3: Vessels with non-ribbed neck and handles

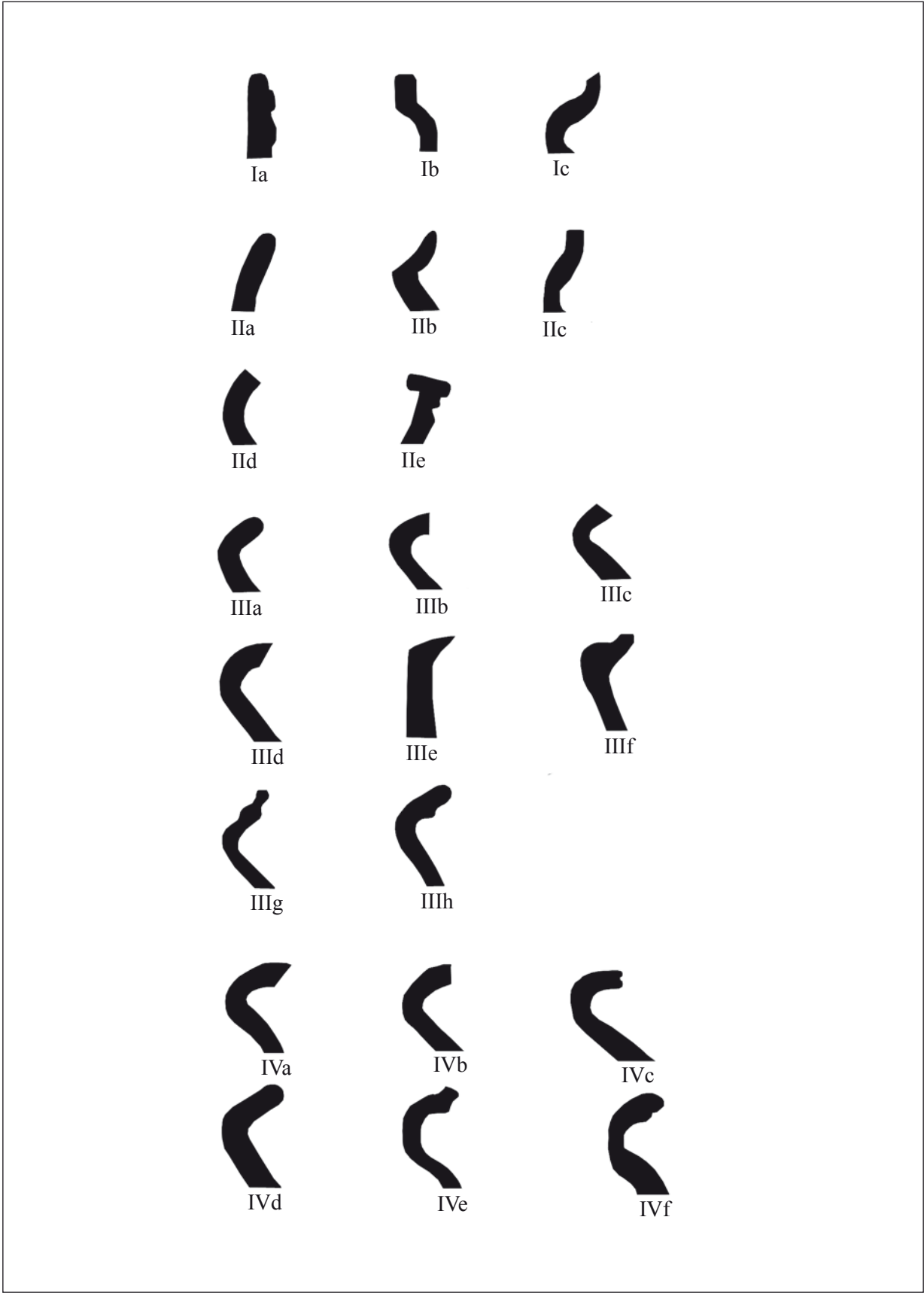


Fig. 11: The classification of rim types

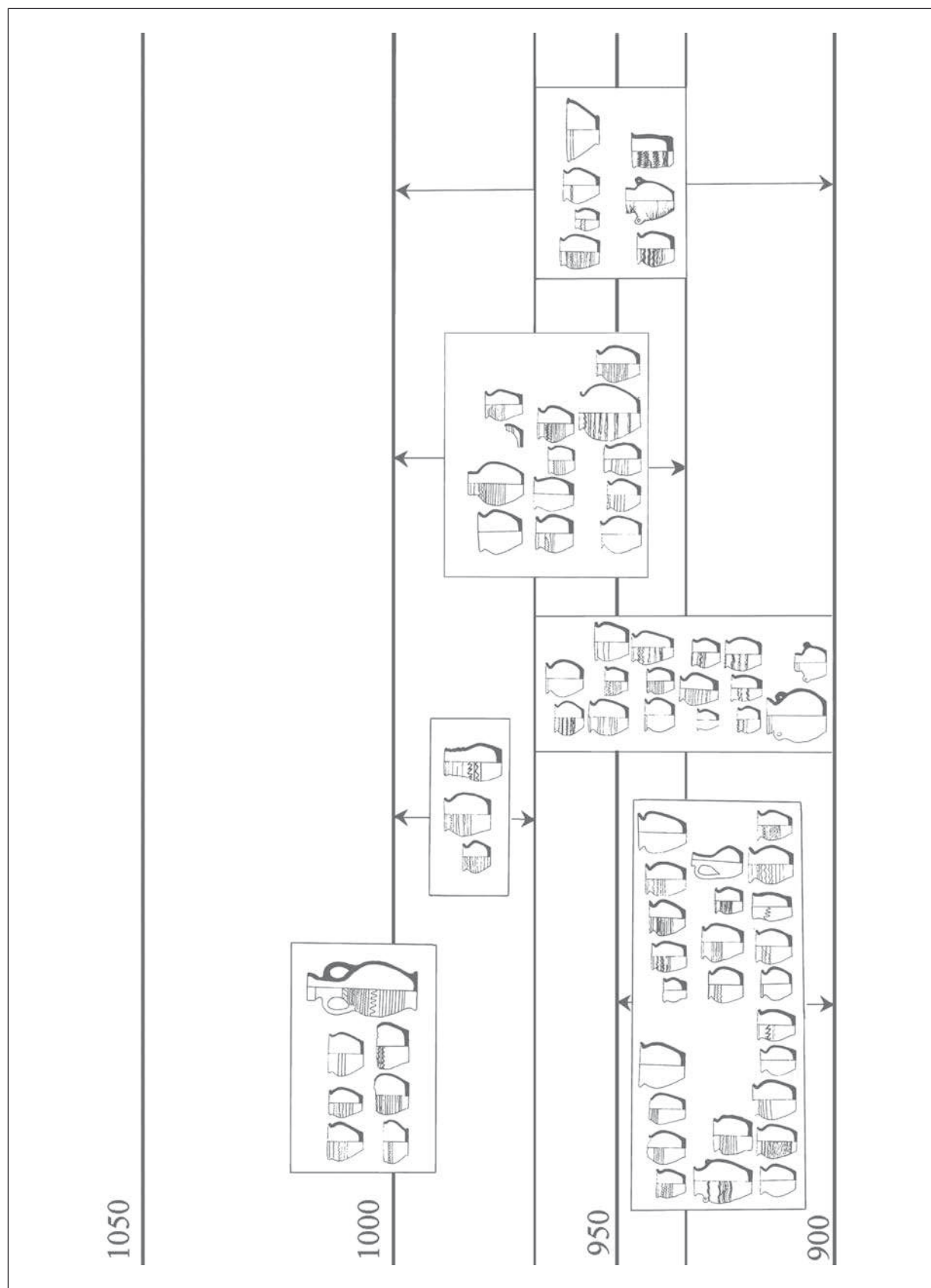


Fig. 12: Chronology based on dating the associated finds from graves with vessels and the various phases of the given cemeteries



*Fig. 13: 1: Ágcsernyő-Nagyréti domb; 2: Bély; 3: Bodroghalom-Eresztvényhomok, Grave 9;
4: Bodroghalom-Eresztvényhomok, Grave 18; 5: Bodroghalom-Eresztvényhomok, Grave 24;
6: Bodroghalom-Eresztvényhomok, Grave 25*

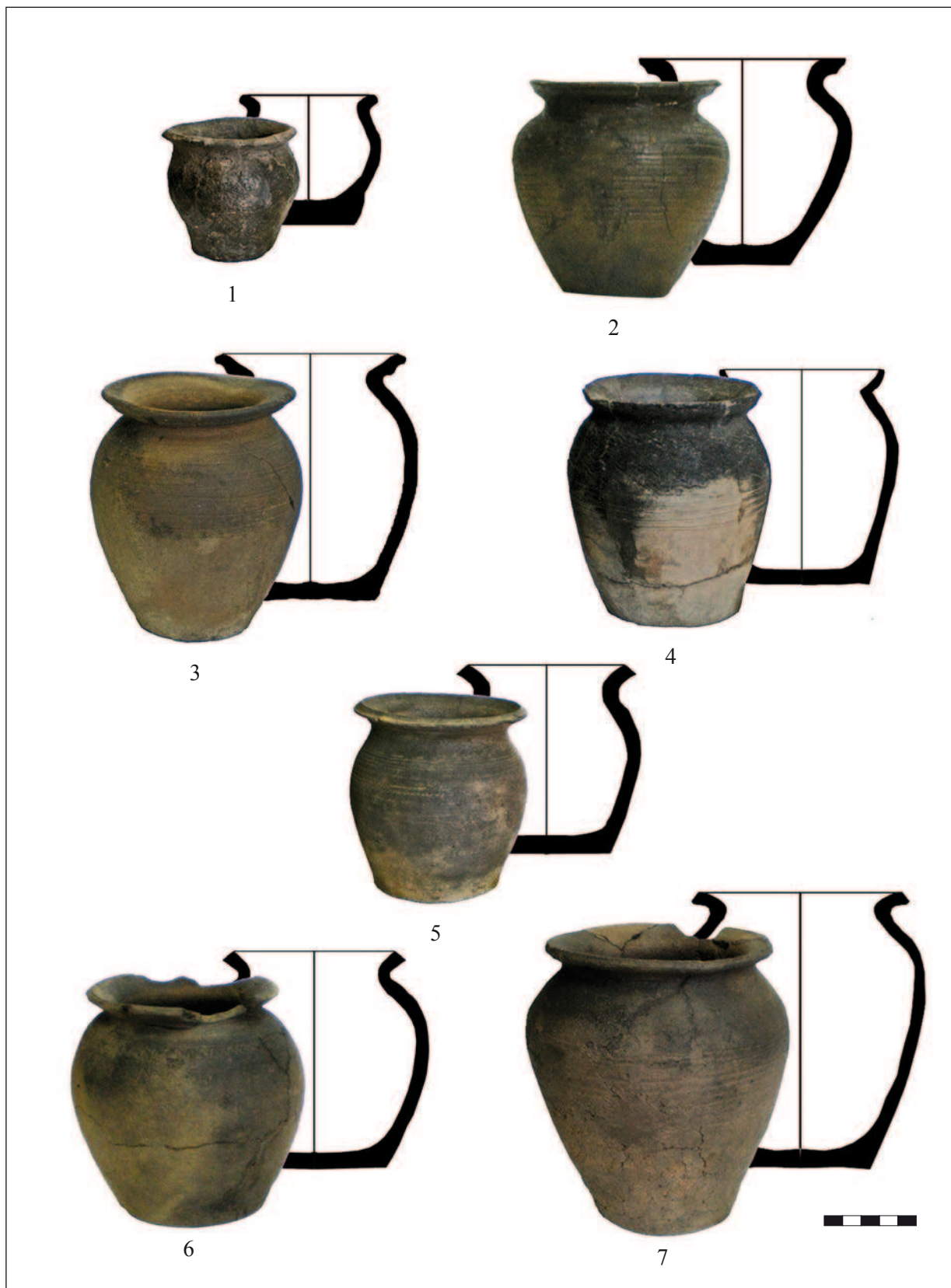


Fig. 14: 1: Karos-Eperjesszög II, Grave; 2: Karos-Eperjesszög II, Grave 24; 3: Karos-Eperjesszög II, Grave 22; 4: Karos-Eperjesszög II, Grave 3; 5: Karos-Eperjesszög II, Grave 64; 6: Karos-Eperjesszög II, Grave 39; 7: Karos-Eperjesszög II, Grave 48



Fig. 15: 1: Karos-Eperjesszög II, Grave 66; 2: Karos-Eperjesszög III, Grave 18; 3: Karos-Eperjesszög III, Grave 16; 4: Karos-Eperjesszög II, Grave 31



Fig. 16: 1: Bodrogszerdahely-Bálványhegy, Grave I; 2: Bodrogszerdahely-Bálványhegy, Grave 7;
3: Sárospatak-Baksahomok, Grave 3; 4: Miskolc-Repülőtér, stray find; 5: Miskolc-Repülőtér, Grave 12;
6: Edelény-Semmelweis utca, Grave 7

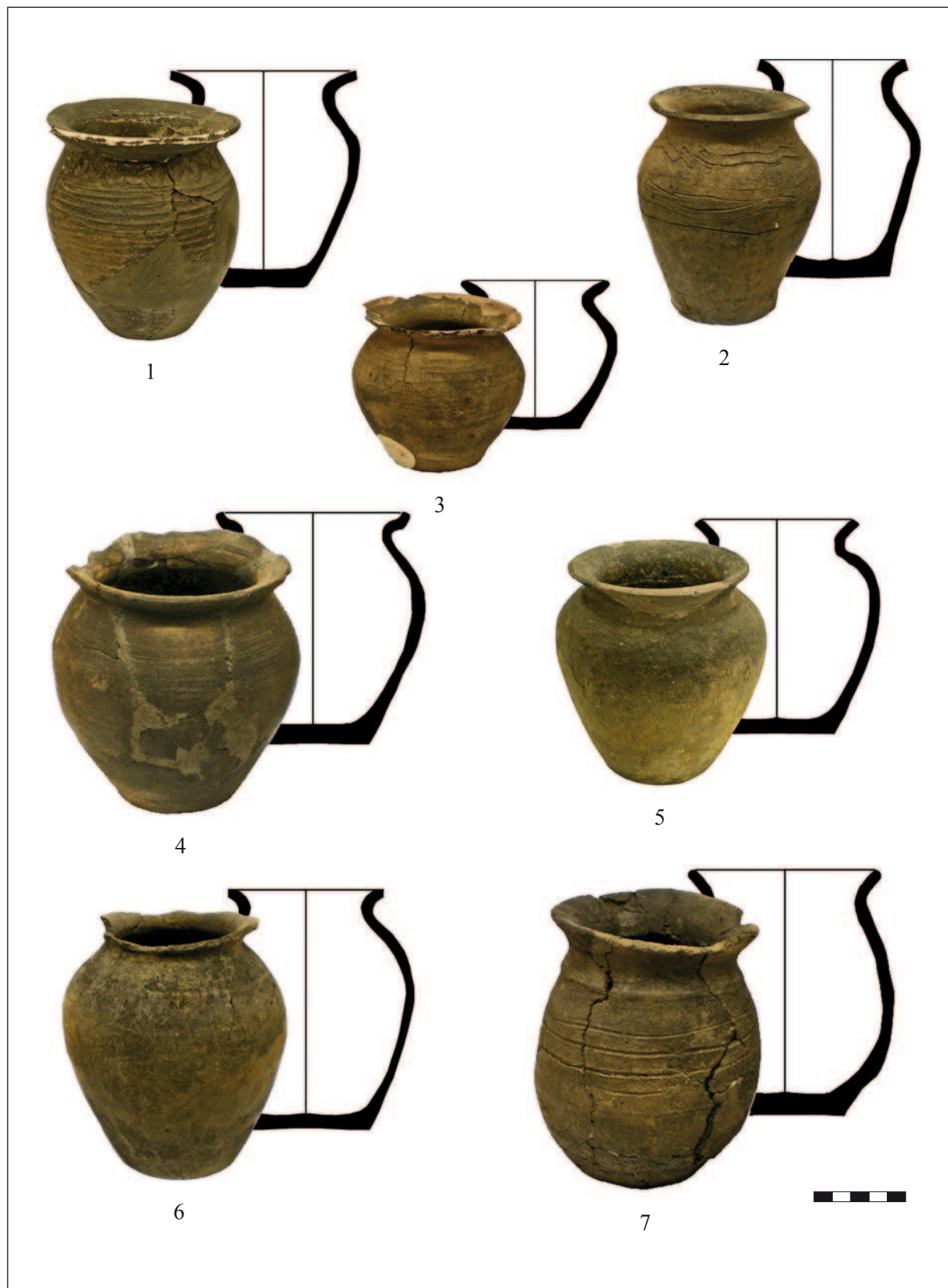


Fig. 17: 1: Pap-Balázshegy, stray find; 2: Gáva-Vásártér, Grave 18; 3: Nagyhalász-Zomborhegy, Grave 1; 4: Ibrány-Esbóhalom, Grave 164; 5: Tiszatardos-Reviczky uradalom; 6: Ibrány-Esbóhalom, Grave 164; 7: Ibrány-Esbóhalom, Grave 165

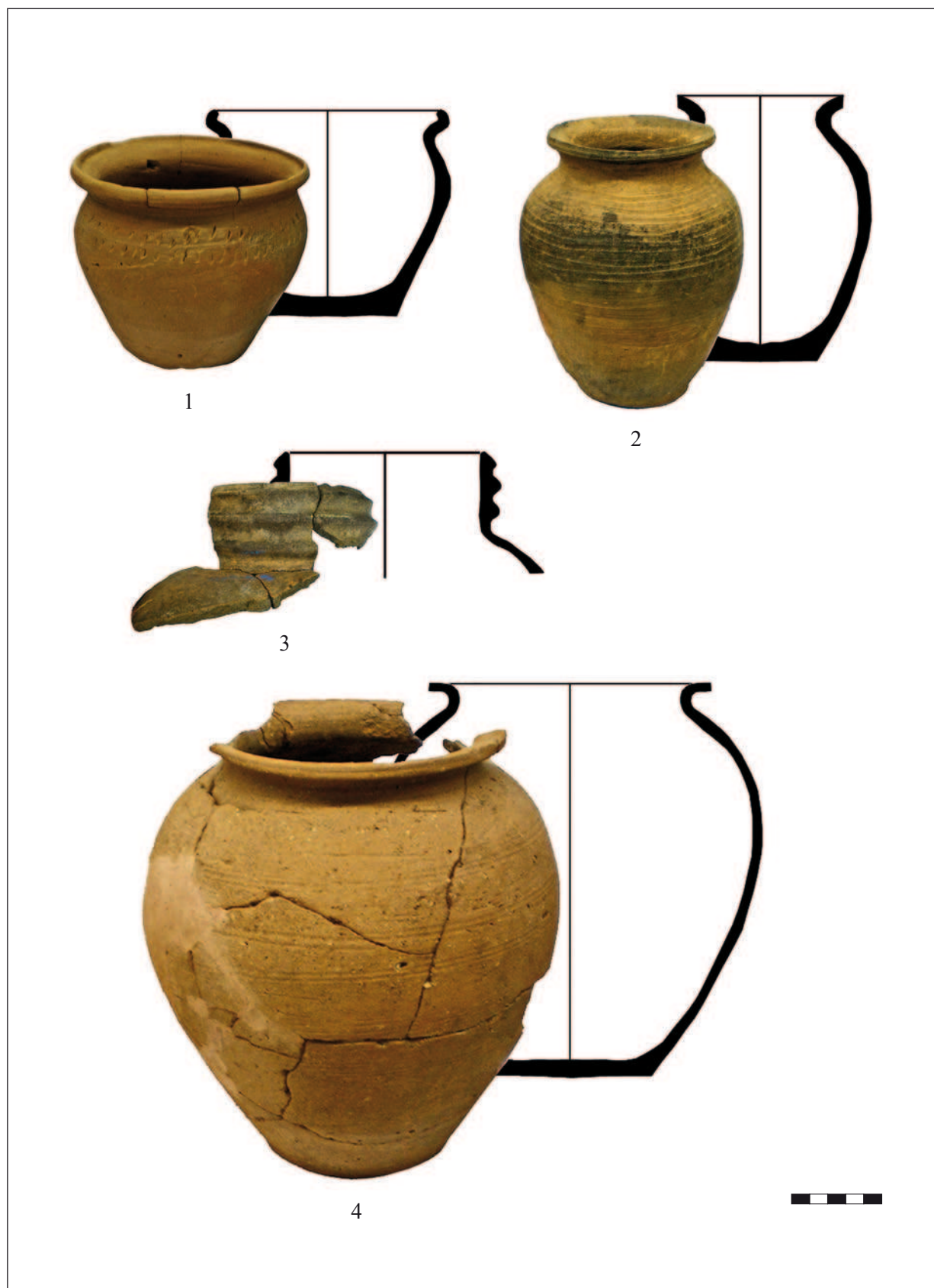


Fig. 18: 1: Kálmánháza-Vitézsor, Grave 39; 2: Ibrány-Esbóhalom, Grave 255; 3: Kálmánháza-Vitézsor, Grave 39; 4: Ibrány-Esbóhalom, Grave 251

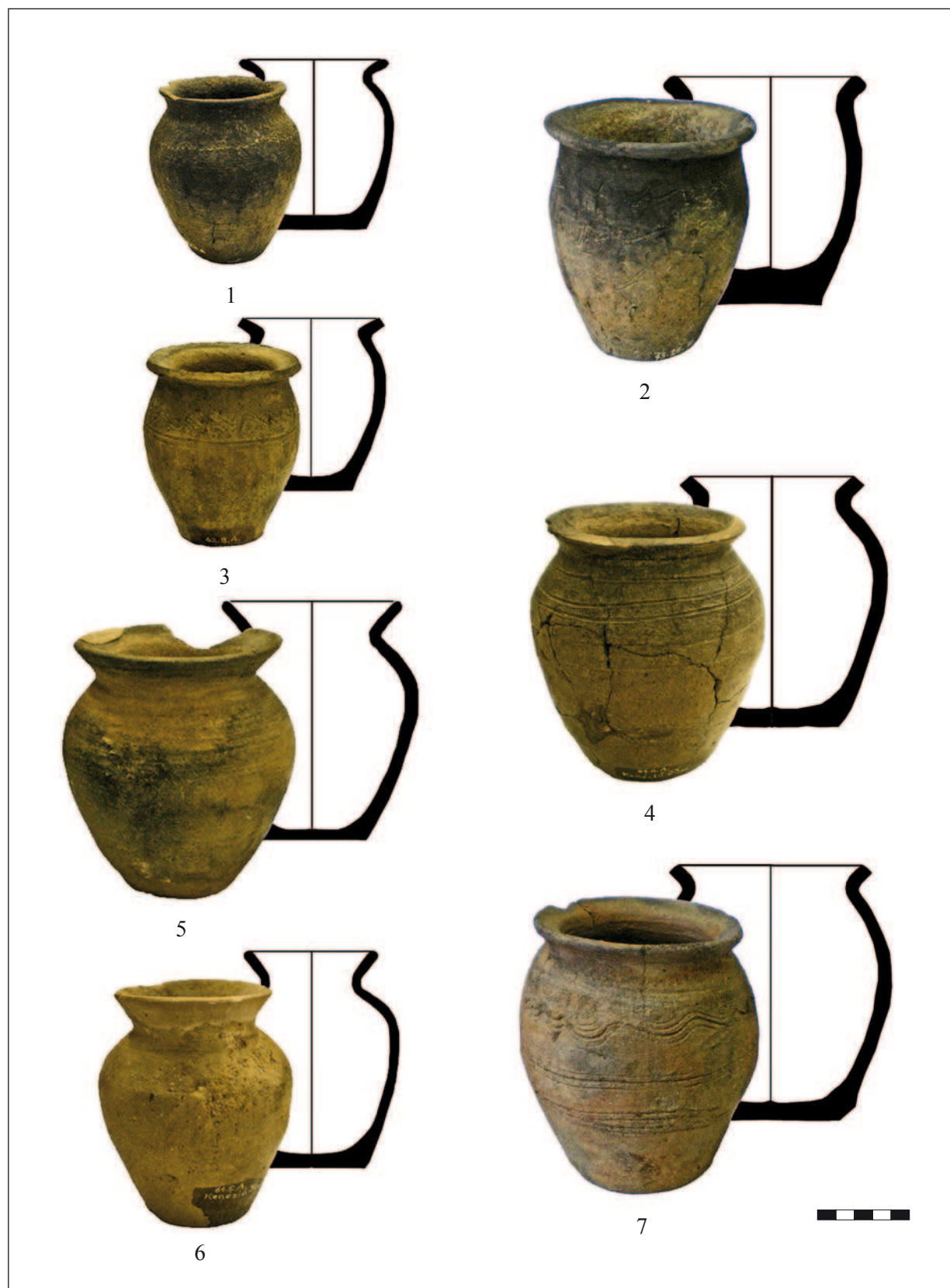


Fig. 19: 1: Kenézlő-Fazekaszug II, Grave 32; 2: Kistokaj-Homokbánya, Grave 59; 3: Kenézlő-Fazekaszug II, Grave 38; 4: Kenézlő-Fazekaszug II, Grave 33; 5: Kenézlő-Fazekaszug II, Grave 32; 6: Kenézlő-Fazekaszug II, Grave 37; 7: Kistokaj-Homokbánya, stray find



Fig. 20: 1: Szabolcs-Petőfi utca, Grave 389; 2: Szabolcs-Petőfi utca, Grave 382; 3: Szabolcs-Petőfi utca, Grave 387; 4: Tímár-Béke Tsz. majorja I, Grave 24; 5: Tímár-Béke Tsz. majorja I, Grave 15

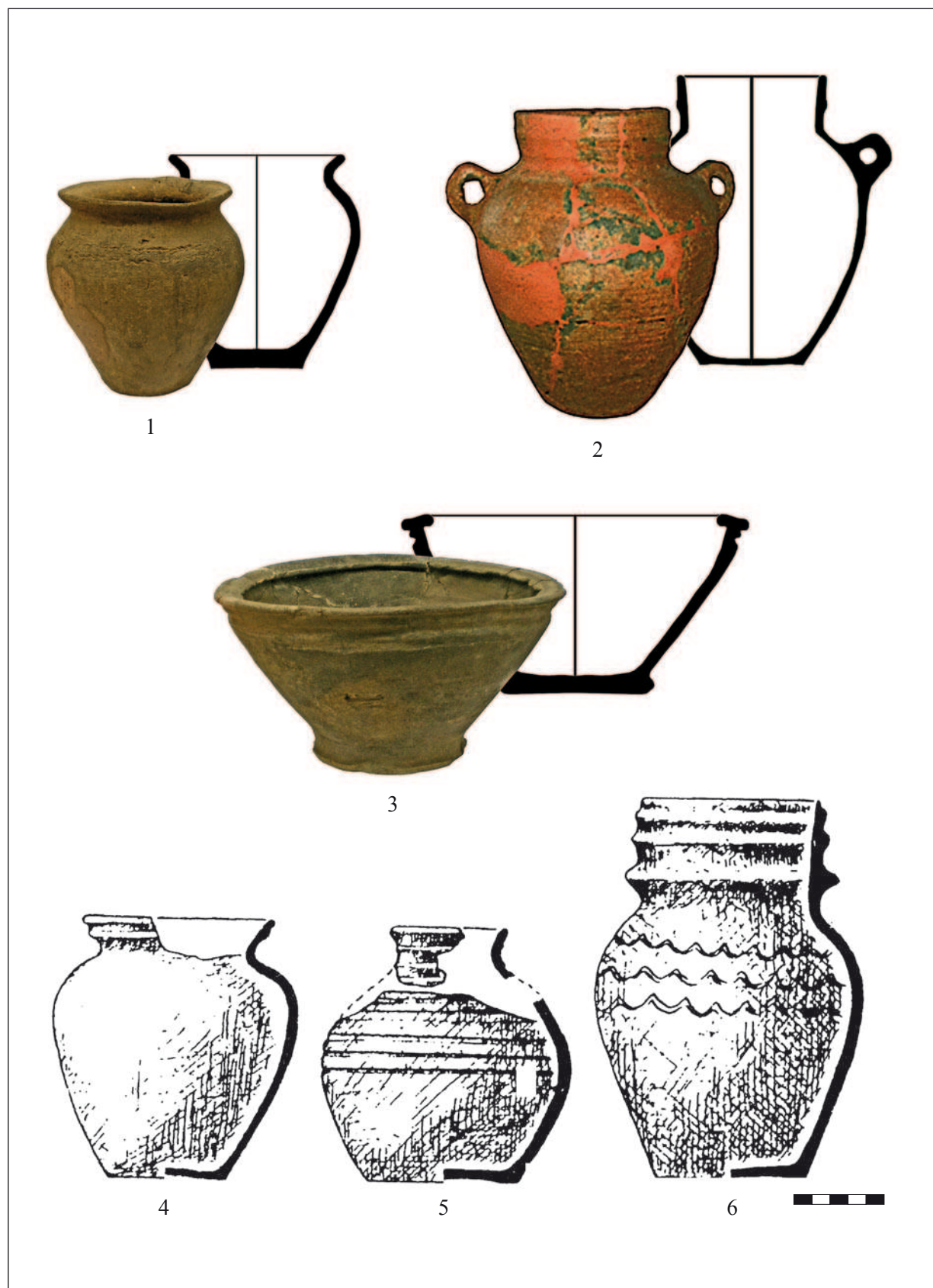


Fig. 21: 1: Tiszabercel-Ráctemető, Grave 8; 2: Tarpa-Nagyhegy; 3: Tiszabercel-Ráctemető, Grave 9; 4–6: Tiszacsoma-Szipahát (after KOBÁLY 2001)



Fig. 22: 1: Tímár-Béke Tsz. majorja II, Grave 4; 2: Tiszabездéd-Harangláb, Grave 3;
3: Tímár-Béke Tsz. majorja I, Grave 16; 4: Tiszaeszlár-Újtelep, Grave 4



*Fig. 23: 1: Tiszacsege- Rákóczi utca; 2: Debrecen-Józsa, Grave 23;
3: Berekböszörmény-Reformátustemplom, Grave 1; 4: Tiszabura-Szőlőskert dűlő, Grave A;
5: Nagyhegyes-Józsa tanya; 6: Hajdúsámson-Majorsági föld*



Fig. 24: 1: Sárrétudvari-Hízóföld, Grave 88; 2: Dormánd-Hanyipusztá, Grave 6;
 3: Törökszentmiklós-Szenttamás, Grave 39; 4: Aldebrő-Mocsáros, Grave 15; 5: Dormánd-Hanyipusztá, Grave 8;
 6: Törökszentmiklós-Szenttamás, Grave 44; 7: Tiszanána-Csehtanya, Grave 4



Fig. 25: 1–2: Eger-Szépásszonyvölgy; 3: Szob-Kiserdő, Grave 60; 4: Szob-Kiserdő, Grave 73; 5: Szob-Kiserdő, Grave 41; 6: Szob-Kiserdő, Grave 23



Fig. 26: Sósartyán-Murahegy, Grave 3

APPENDIX 1

Catalogue – sites with vessel(s) from graves dated to the 10th–11th-century

Site	Most important literature
The Upper Tisza region	
Ágcsernyő-Nagyréti domb	PASTOR 1952, 485–487; FEHÉR–ÉRY–KRALOVÁNSZKY 1962, 27.
Aranyosapáti-Aranyoshegy	DIENES 1961, 193; TETTEMANTI 1975, 83.
Bély	EISNER 1966, 166.
Bodroghalom-Eresztvényhomok, Grave 9, 18, 20, 22, 25	RÉVÉSZ 2006, 414–415.
Bodrogszerdahely-Bálványhegy, Grave I/1, 7	ERDÉLYI 1961, 17–18; FEHÉR–ÉRY–KRALOVÁNSZKY 1962, 67.
Edelény-Semmelweis utca, Grave 5, 7	unpublished
Gáva-Vásártér, Grave 18	KALICZ 1958, 207; FEHÉR–ÉRY–KRALOVÁNSZKY 1962, 329; ISTVÁNOVITS 2003, 58.
Ibrány-Esbóhalom, Grave 164, 165, 251, 255	ISTVÁNOVITS 2003, 71–112.
Kálmánháza-Vitézsor, Grave 39	unpublished
Karos-Eperjesszög I, Grave 12, 13	DÓKUS 1900; FEHÉR–ÉRY–KRALOVÁNSZKY 1962, 46; RÉVÉSZ 1996a, 13–15.
Karos-Eperjesszög II, Grave 1, 3, 22, 24, 31, 39, 48, 64, 66	RÉVÉSZ 1996a, 15–33.
Karos-Eperjesszög III, Grave 16, 18, 19	RÉVÉSZ 1996a, 33–38.
Kenézlő-Fazekaszug II, Grave 32, 33, 37, 38, 41	JÓSA 1914, 304–340; FETTICH 1931, 78; FEHÉR–ÉRY–KRALOVÁNSZKY 1962, 47.
Kistokaj- Homokbánya, Grave 59	VÉGH 1993, 53–103.
Miskolc-Diósgyőr	RÉVÉSZ 1992, 107.
Miskolc-Repülőtér, Grave 9, 11, 12	RÉVÉSZ 1992, 98–103.
Nagyhalász-Homoktanya	JÓSA 1914, 174–176.
Nagyhalász-Zomborhegy, Grave 1908/B; Grave Jósa 3	FEHÉR–ÉRY–KRALOVÁNSZKY 1962, 55; ISTVÁNOVITS 2003, 146–149; KOVÁCS 1989, 171–173.
Pap-Balázshegy	KRALOVÁNSZKY 1960, 27–34.
Sárospatak-Baksatanya, Grave 3	FODOR 1996a, 168–169.
Szabolcs-Petőfi utca 382, Grave 387, 389	KOVÁCS 1994, 1–406.
Szolyva-Keresztes halom, Grave 1	LEHOCZKY 1870, 201–202; KOBÁLY 2001, 217–218.
Tarpa-Nagy-hegy	ISTVÁNOVITS 1996, 19–25.
Tímár Béke Tsz majorja, Grave 1, 15, 16, 24	KOVÁCS 1988, 125–145.
Tímár Béke Tsz majorja II, Grave 4	KOVÁCS 1988, 145–146
Tiszabercel-Ráctemető, Grave 8, 9	FEHÉR–ÉRY–KRALOVÁNSZKY 1962, 78; CSALLÁNY 1959, 300; ISTVÁNOVITS 2003, 190–193.

Tiszabezdéd-Harangláb, Grave 3	RÉVÉSZ 2003, 432–440.
Tiszacsoma-Szipa hát	БАЛАГУРИ–ФОДОР 1998, 166–196; KOBÁLY 2001, 207–209.
Tiszaeszlár-Fenyvespart II, Grave 11, 12	TÓTH 2008, 32–48.
Tiszaeszlár-Sinkahegy	JÓSA 1914, 172–174; FEHÉR–ÉRY–KRALOVÁNSZKY 1962, 79.
Tiszaeszlár-Ujtelep, Grave 4	FODOR 1996b, 194–195.
Tiszalök-Fészekalja	FEHÉR–ÉRY–KRALOVÁNSZKY 1962, 79.
Tiszalök-Kisfástanya	FEHÉR–ÉRY–KRALOVÁNSZKY 1962, 79–80.
Tiszatardos-Reviczky uradalom	FEHÉR–ÉRY–KRALOVÁNSZKY 1962, 80.
East of the Tisza river to Bihar in the east and the Sebes-Körös river in the South	
Berekböszörmény-Pál dombja	MESTERHÁZY 1968, 47; NEPPER 1996, 153.
Berekböszörmény-Református templom, Grave 1	NEPPER 2002, 25–26.
Bihar-Somlyóhegy, Grave 3	FEHÉR–ÉRY–KRALOVÁNSZKY 1962, 1962, 24; HAMPEL 1907, 104–106.
Debrecen-Józsa, Clara Zetkin utca, Grave 23	NEPPER 1996, 153; NEPPER 2002, 32–33.
Debrecen-Vincellér utca	NEPPER 1996, 153.
Hajdúdorog-Temetőhegy	SÓREGI 1938, 46–48.
Hajdúsámson-Majorsági föld	ZOLTAI 1907, 36–39; FEHÉR–ÉRY–KRALOVÁNSZKY 1962, 39; NEPPER 1996, 152.
Hajdúszoboszló-Árkoshalom, Grave 147, 189	NEPPER 2002, 58–107.
Körösszegapáti-Pállapály, Grave 27	NEPPER 1996, 153, 156; NEPPER 2002, 122–126.
Nagyhegyes-Józsa tanya	KRALOVÁNSZKY 1965, 40.
Sárrétudvari-Hízóföld, Grave 88, 190	NEPPER 2002, 358–359.
Tiszabura-Szőlőskert dűlő, Grave A	FEHÉR–ÉRY–KRALOVÁNSZKY 1962, 78; HORVÁTH 1934, 141–144.
Tiszacsege-Rákóczi u. 24	NEPPER 1996, 153.
Tiszafüred-Nagykenderföldek, Grave 71	FODOR 1974, 68–69.
Tiszaroff-Ajtósi part, Grave 2	KVASSAY 1982, 221–222.
Törökszentmiklós-Szenttamás, Grave 39, 44	unpublished
The northern third of the Danube–Tisza interfluvium to the southern border of Pest and Jász-Nagykun-Szolnok Counties	
Albertirsa-Öregszőlők	FEHÉR–ÉRY–KRALOVÁNSZKY 1962, 20.
Budapest-XIX. Ker, Pestszentlőrinc-Gloriette	LÁSZLÓ 1942, 799; FEHÉR–ÉRY–KRALOVÁNSZKY 1962, 124.
Dabas-Tatárszentmiklósi határ	KISS 1969, 179.
Farmos-Büdöslapos	PÁLÓCZI 1964, 62.
Jászdózsa-Kápolnahalom	FEHÉR–ÉRY–KRALOVÁNSZKY 1962, 44.
Monori erdő, Grave 3, 4, 5	TÖRÖK 1958, 207.

Nagykátá- Felsőegreskátá	FEHÉR-ÉRY-KRALOVÁNSZKY 1962, 713.
Szolnok-Ugar (Lenin-Tsz), Grave 4, 5, 10, 14, 18, 28	MADARAS 1996, 65–70.
Tiszasüly-Éhhalom	MADARAS 1996, 74.
Üllő-Hosszúberekpéteri, Grave 2	FEHÉR-ÉRY-KRALOVÁNSZKY 1962, 82.
Zagyvarékas-Avas	FEHÉR-ÉRY-KRALOVÁNSZKY 1962, 84.
Northern Hungary	
Aldebrő-Mocsáros, Grave 15	SZABÓ 1963, 103–105; RÉVÉSZ 2008, 18–51.
Balassagyarmat	PATAY 1957, 60.
Besenyőtelek-Szörhát	SZABÓ 1969, 55; RÉVÉSZ 2008, 52–53.
Csesztve	NYÁRY 1904, 359.
Dormánd-Hanyipusztá, Grave 6, 8	FEHÉR-ÉRY-KRALOVÁNSZKY 1962, 32; SZABÓ 1963, 163–164; RÉVÉSZ 2008, 74–95.
Eger-Szépasszonyvölgy, Grave 26	BARTALOS 1899, 129–130, 353–360; FEHÉR-ÉRY-KRALOVÁNSZKY 1962, 33; RÉVÉSZ 2008, 109–123.
Füzesabony-Réti tanya	FOLTINY 1885, 125; SZABÓ 1969, 55; RÉVÉSZ 2008, 181.
Jobbágyi, Mátra u. 25	SOÓS 1982, 79.
Kóspallag-Kishantapatak, Grave 1	LANGÓ 2003, 81–85.
Lőrinci-Selypi pusztá	KÖNYÖKI 1892, 227–235; FEHÉR-ÉRY-KRALOVÁNSZKY 1962, 51; SZABÓ 1969, 57; RÉVÉSZ 2008, 244–247.
Ludányhalászi- Apáti pusztá, Grave 2	PINTÉR 1887, 430–432.
Novaj	BARTALOS 1899, 358–360; SZABÓ 1969, 55; RÉVÉSZ 2008, 252.
Rózsaszentmárton-Felsőcsér, Grave 5	SZABÓ 1964, 66; RÉVÉSZ 2008, 267–271.
Sóshartyán-Murahegy, Grave 3	FEHÉR-ÉRY-KRALOVÁNSZKY 1962, 67; FODOR 1996c 406.
Szécsény, Szügy állami gazdaság	GÁDOR 1970, 57–58.
Szob-Ipolypart, Grave 4, 13	BAKAY 1978, 53–55.
Szob-Kiserdő, Grave 15, 23, 32, 41, 60, 73, 77	BAKAY 1978, 8, 128–141.
Szob-Vendelin-földek Grave 1, 9, 12, 16, 17, 23, 25, 30, 48, 67, 108, 118	TÖRÖK 1956, 129–135; BAKAY 1978, 144.
Tiszanána-Cseh-tanya, Grave 4	FEHÉR-ÉRY-KRALOVÁNSZKY 1962, 80; SZABÓ 1969, 55; RÉVÉSZ 2008, 283–390.
Vác-Hétkápolna	FEHÉR-ÉRY-KRALOVÁNSZKY 1962, 82.
Vác-Derecskedűlő	FEHÉR-ÉRY-KRALOVÁNSZKY 1962, 82.
Visonta-Felsőréti, Grave 9	RÉVÉSZ 2008, 349–377.
Visznek-Kecskehegy, Grave 35	SZABÓ 1969, 55, 57; TÖRÖK 1975, 322–338; RÉVÉSZ 2008, 380–386.

APPENDIX 2

	BÁCSA-SZENT VID	BÁCSA-SZENT VID	MÉNFOCSANAK-SZELES	MÉNFOCSANAK-SZELES	COLUMN TOTALS	COLUMN TOTALS
	observed value	expected value	observed value	expected value	observed	theoretical
undecorated	226	239,10	233	219,89	459	459
straight line bundle	130	103,14	68	94,85	198	198
wavy line bundle	91	68,24	40	62,75	131	131
scroll	68	121,37	165	111,62	233	233
wavy line bundle + straight line bundle	25	16,66	7	15,33	32	32
wavy line	25	22,92	19	21,07	44	44
densely incised scrolls	20	13,54	6	12,45	26	26
ROW TOTALS	585	585	538	538		1123
Chi Square = 96,441						
Degrees of Freedom = 6						
P = 0						

Fig. 1: Chi-square test – statistical study of the decorative motifs used of the ceramic finds, at two early medieval sites, ceramic finds, Bácsa-Szent Vid domb and Ménfőcsanak-Szeles (NW-Hungary)

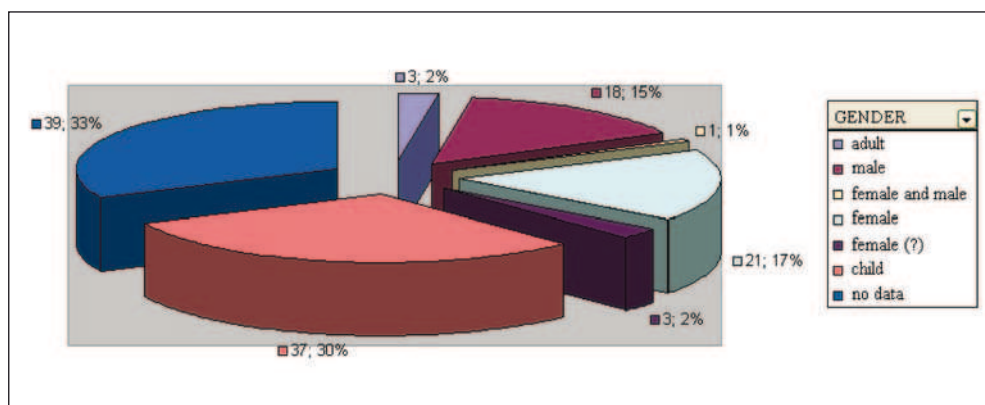


Fig. 2: Sex and graves with vessels

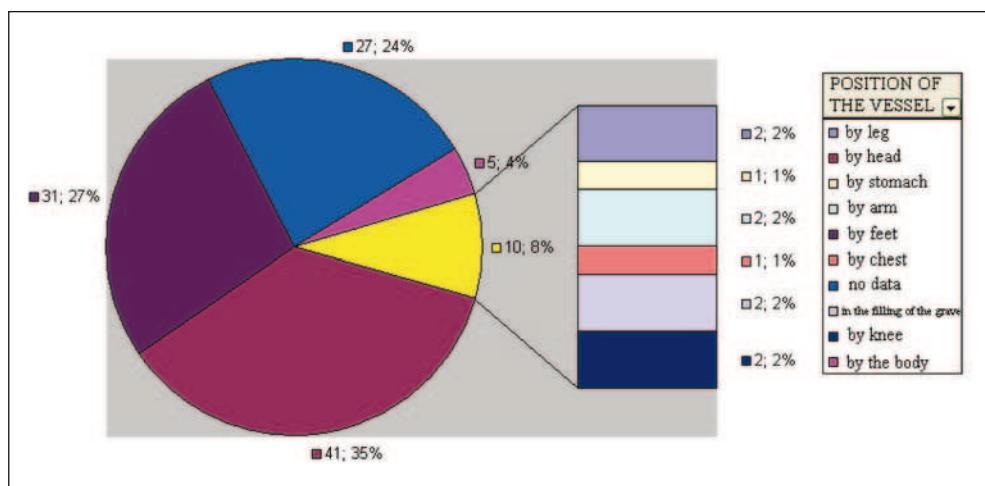


Fig. 3: Position of the vessel in the grave

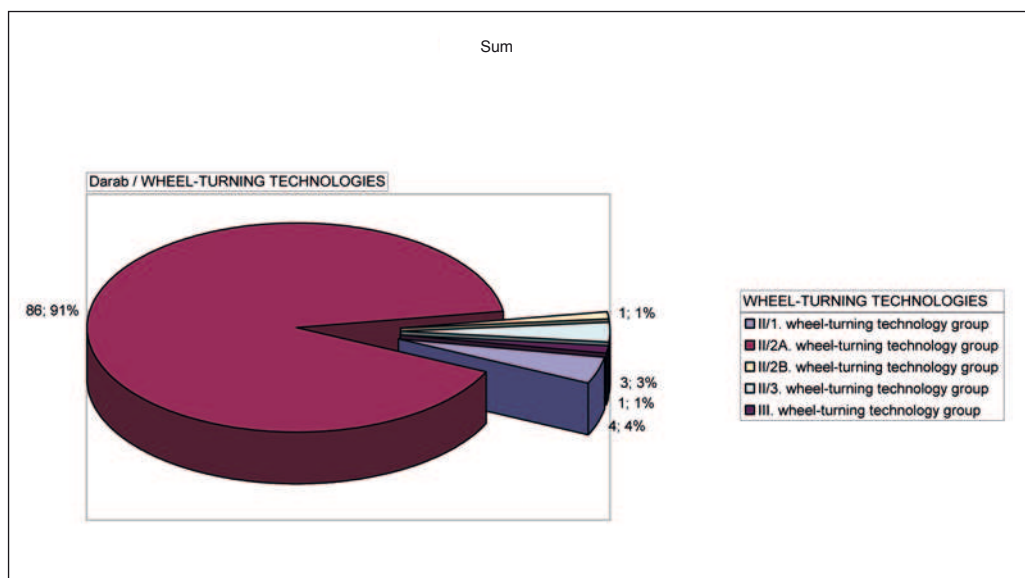


Fig. 4: Technological variability regarding the throwing by vessels from graves dated back to the 10th–11th-century

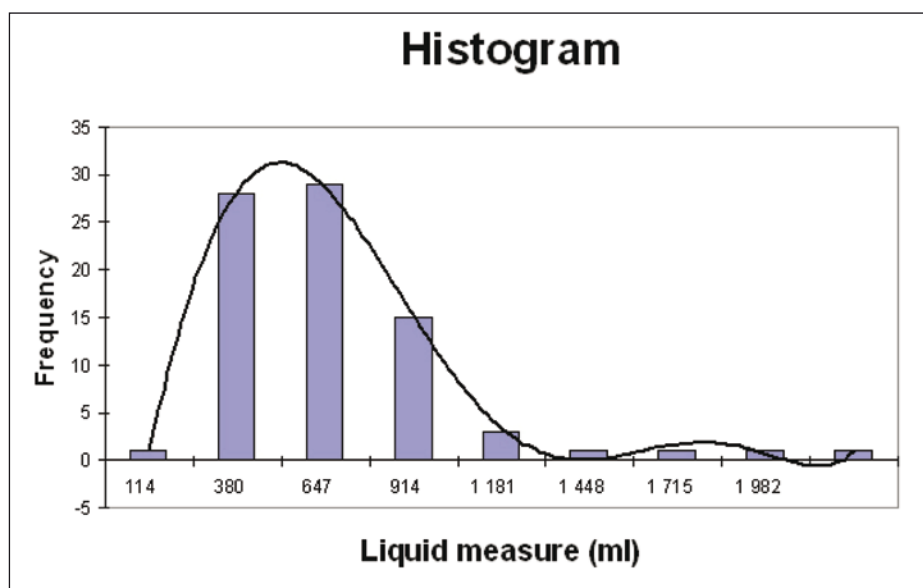


Fig. 5: Histogram of vessels' liquid measure from graves

APPENDIX 3

Classification of vessels from graves dated to the 10th–11th-century

<i>Type I: Jars</i>	
<i>Subtype I/1: jars with wide mouth</i>	
<i>Group I/1A</i>	Sárospatak-Baksahomok, Grave 4
	Tímár-Béke Tsz. majorja I, Grave 15
	Bodroghalom-Eresztvényhomok, Grave 9
	Szabolcs-Petőfi utca, Grave 387
	Tímár-Béke Tsz. majorja I, Grave 24
<i>Group I/1B</i>	Kálmánháza-Vitézsorok, Grave 39
	Tiszabura-Szőlőskert dűlő, Grave A
<i>Subtype I/2: globular jars</i>	
	Szob-Kiserdő, Grave 60
	Kistokaj-Homokbánya, szórvány
	Aldebrő-Mocsáros, Grave 15
	Gáva-Vásártér, Grave 18
	Karos-Eperjesszőg III, Grave 18
	Dormánd-Hanyipuszt, Grave 8
	Bodrogszerdahely-Bálványos, Grave 7
	Karos-Eperjesszőg II, Grave 24
	Tiszanána-Csehtanya, Grave 4
	Kóspallag-Kishantapatak, Grave 1
	Dormánd-Hanyipuszt, szórvány
	Eger-Szépasszonyvölgy, Grave 26
	Bodroghalom-Eresztvényhomok, Grave 25
	Miskolc-Repülőtér, szórvány
<i>Subtype I/3: normal jars</i>	
<i>Group I/3A</i>	Karos-Eperjesszőg II, Grave 1
	Debrecen-Józsa, Grave 23
<i>Group I/3B</i>	Ibrány-Esbóhalom, Grave 165
<i>Group I/3C</i>	Kenézlő-Fazekaszug, Grave 32/2
	Kenézlő-Fazekaszug, Grave 38
	Monori erdő, Grave 3
<i>Group I/3D</i>	Törökszentmiklós-Szenttamás, Grave 39
	Kenézlő-Fazekaszug, Grave 37

<i>Group I/3E</i>	Szob-Kiserdő, Grave 73
	Tiszatardos-Reviczky uradalom
	Kenézlő-Fazekaszug, Grave 3
	Ibrány-Esbóhalom, Grave 164
	Tiszabercel-Ráctemető, Grave 8
	Pap-Balázshegy, szórvány
	Bodroghalom-Eresztvényhomok, Grave 24
	Tímár-Béke Tsz. majorja I, Grave 16
	Miskolc-Repülőtér, Grave 4
	Karos-Eperjesszőg II, Grave 48
	Berekböszörmény-Református templom, Grave 1
	Tímár-Béke Tsz. majorja II, Grave 4
	Tiszabездéd-Harangláb, Grave 3
	Berekböszörmény-Pál dombja
<i>Group I/3F</i>	Karos-Eperjesszőg II, Grave 64
	Eger-Szépasszonyvölgy, Grave 21
	Karos-Eperjesszőg II, Grave 39
	Szob-Kiserdő, Grave 23
	Ibrány-Esbóhalom, Grave 164
	Szabolcs-Petőfi utca, Grave 389
	Bodroghalom-Eresztvényhomok, Grave 18
	Karos-Eperjesszőg III, Grave 16
	Kistokaj-Homokbánya, szórvány
	Kenézlő-Fazekaszug, Grave 33
	Ibrány-Esbóhalom, Grave 251
	<i>Subtype I/4: elongated jars</i>
<i>Group I/4A</i>	Hajdúszoboszló-Árkoshalom, Grave 189
	Visznek-Kecskehegy, Grave 35
<i>Group I/4B</i>	Kistokaj-Homokbánya, Grave 59
	Szob-Kiserdő, Grave 32
	Edelény-Semmelweis utca, Grave 7
<i>Group I/4C</i>	Szabolcs-Petőfi utca, Grave 382
	Karos-Eperjesszőg II, Grave 22
	Ibrány-Esbóhalom, Grave 255
<i>Group I/4D</i>	Karos-Eperjesszőg, Grave 3
	Nagyhalász-Kiszombor, Grave 1
	Sárrétudvari-Hízóföld, Grave 88
<i>Group I/4e.</i>	Dormánd- Hanyipusztá, Grave 6
	Karos-Eperjesszőg, Grave 31

<i>Type II: Bowls</i>	
<i>Subtype II/1: flower pot shaped bowl</i>	
	Tiszabercel-Ráctemető, Grave 9
<i>Subtype II/2: bowl with inverted rim</i>	
	Szob-Kiserdő, Grave 41
<i>Type III: Vessels with cylindrical neck</i>	
<i>Subtype III/1: Vessel with ribbed neck and handles</i>	
	Ágcsernyő-Nagyréti domb
	Bély
	Hajdúsámson-Majorsági föld, Grave A
	Tarpa-Nagyhegy
<i>Subtype III/2: Vessels with ribbed neck without handles</i>	
	Miskolc-Repülőtér, Grave 2
	Nagyhegyes-Jónatanya
	Tiszabura-Szőlőskert dűlő
	Tizacsoma-Szipahát
	Kálmánháza-Vitézsorok, Grave 39
<i>Subtype III/3: Vessels with non-ribbed neck and with handles</i>	
	Bodrogszerdahely I, Grave 1
	Tiszaeszlár-Újtelep, Grave 4
<i>Type IV: Amphora</i>	
	Sóshartyán-Murahegy, Grave 3
<i>Type V: One-handled jar</i>	
	Karos-Eperjesszőg II, Grave 66